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(56) Documents Cited
GB 2119141 A GB 1478485 A FR 002502817 A
JP 050287947 A

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INT CL^6 B60R, G08C
ONLINE: WPI

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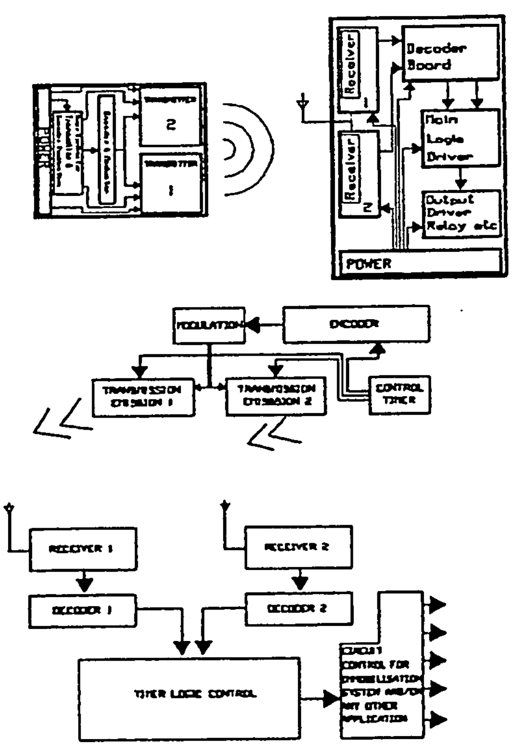
(54) Remote control radio key

(57) A remote control radio key, e.g. for vehicle locking/unlocking, sends half the code combination using one radio frequency then the rest using another radio frequency, to protect against anyone learning the code using an RF scanner or grabber.



GB 2 288 261 A

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1990.

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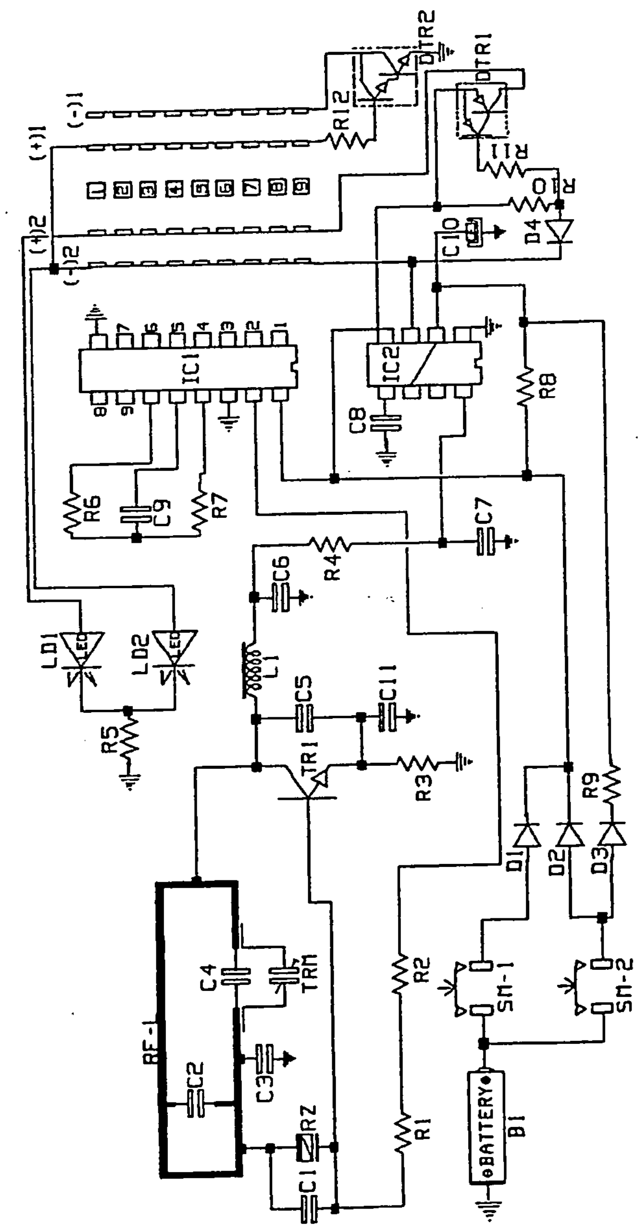

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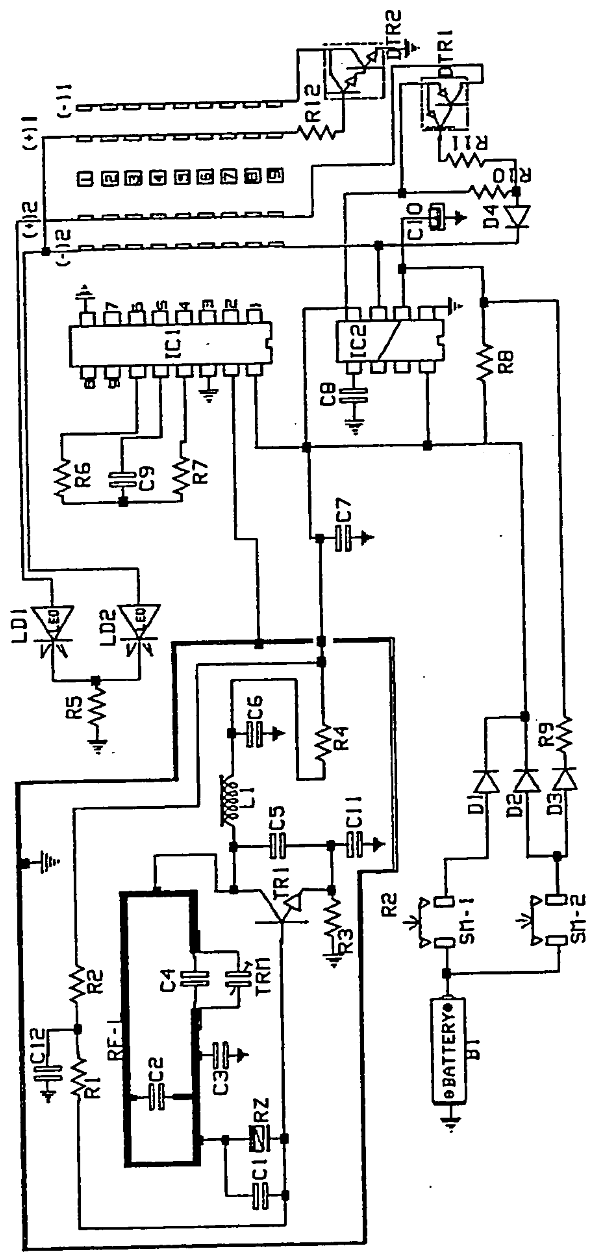

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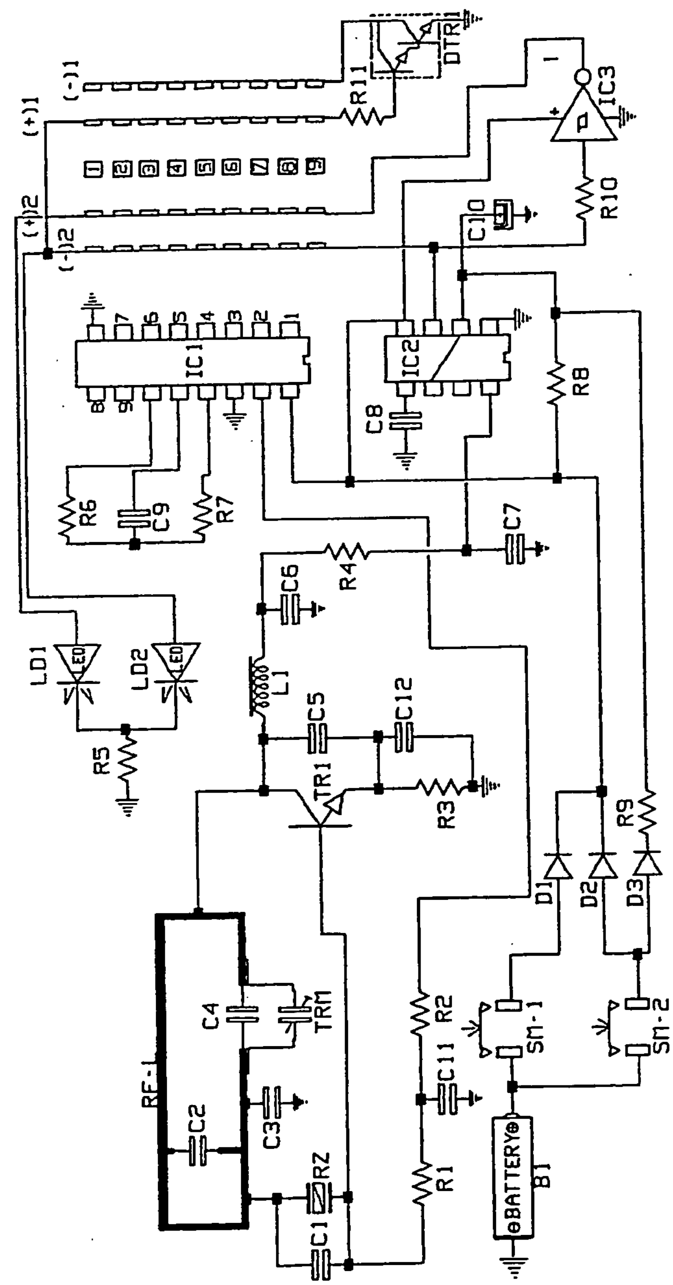

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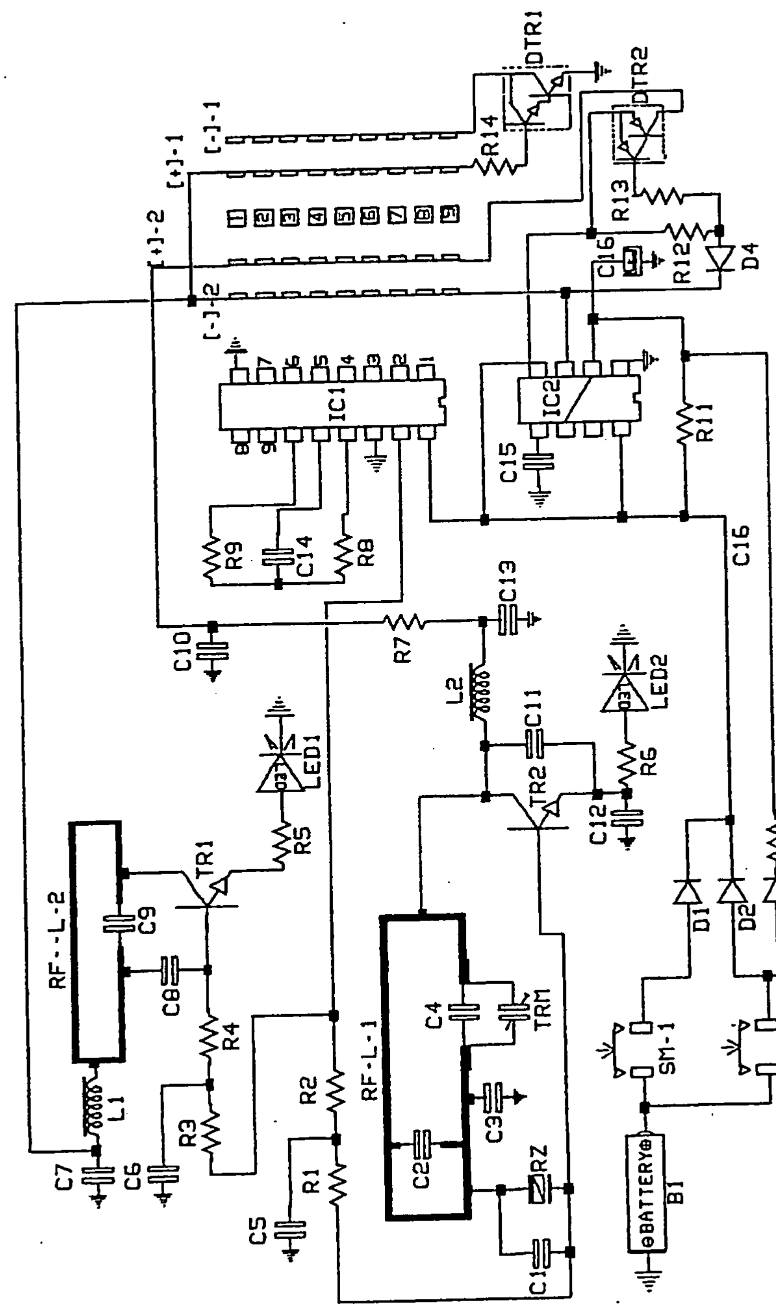

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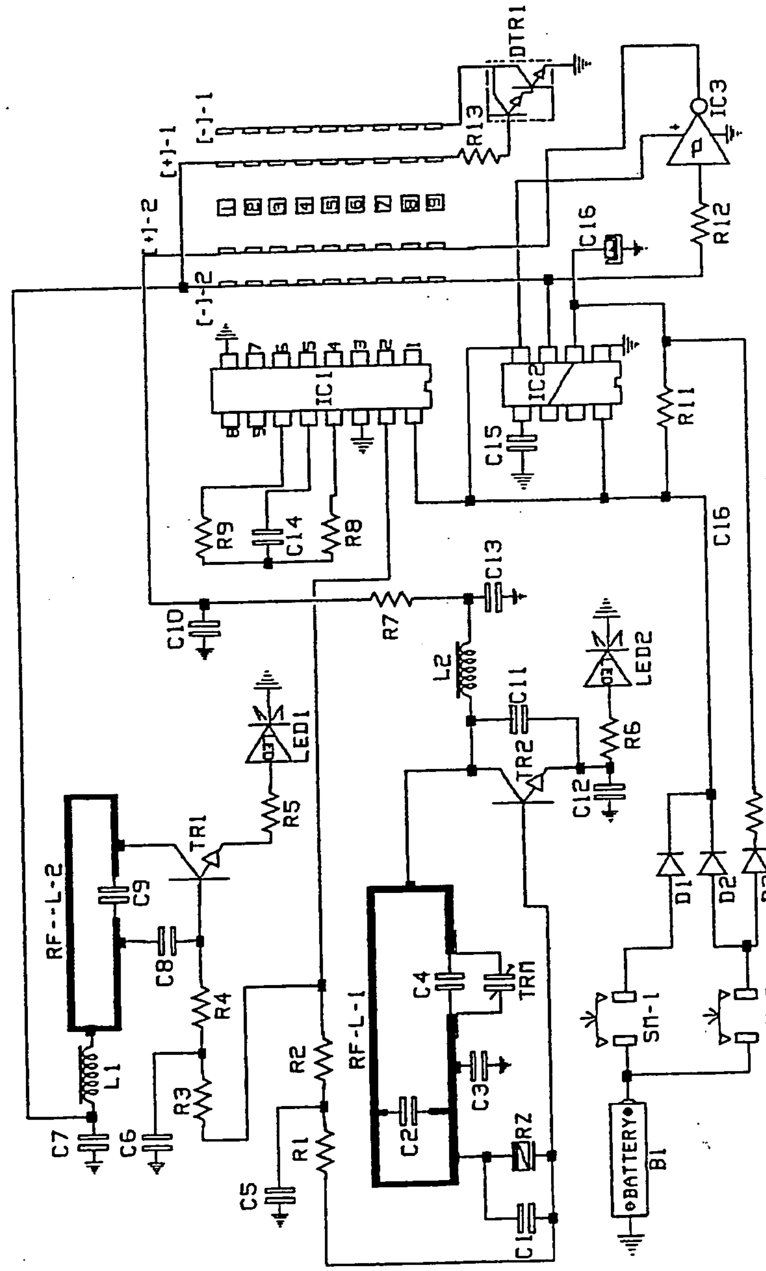

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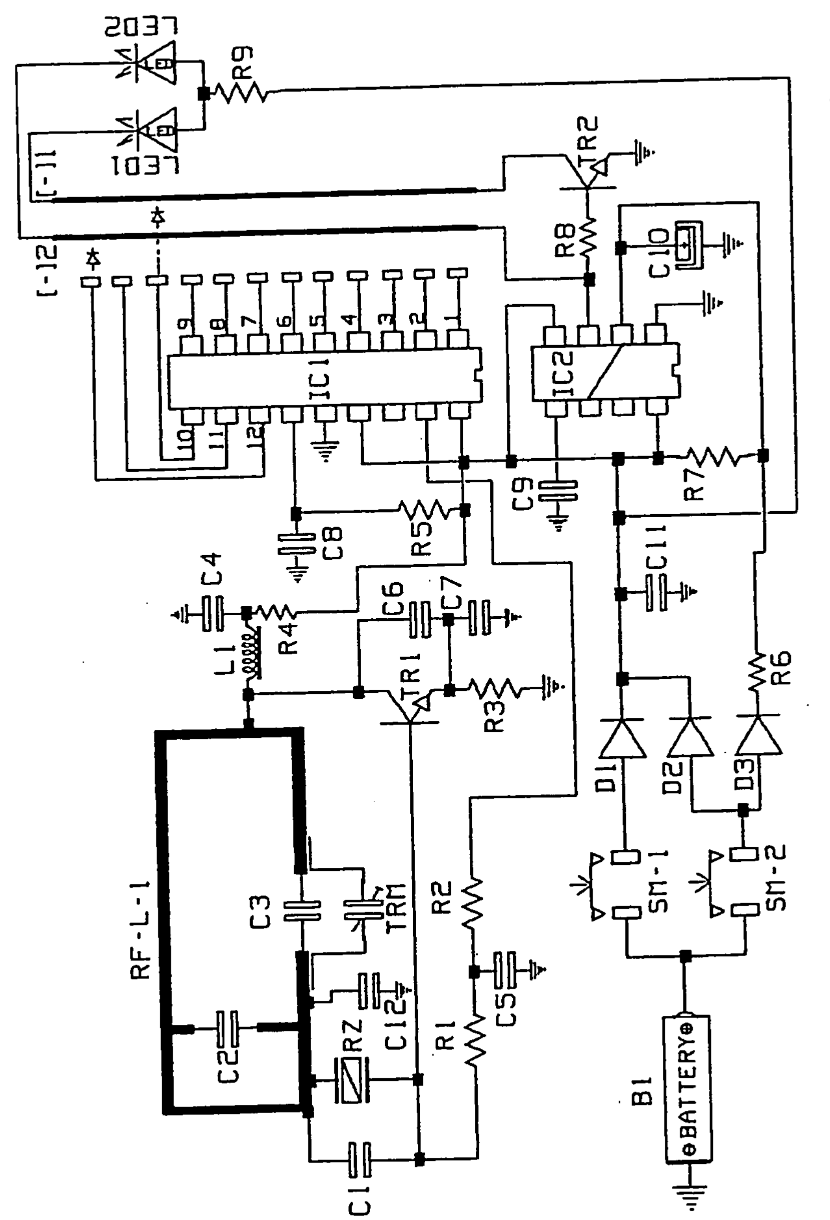

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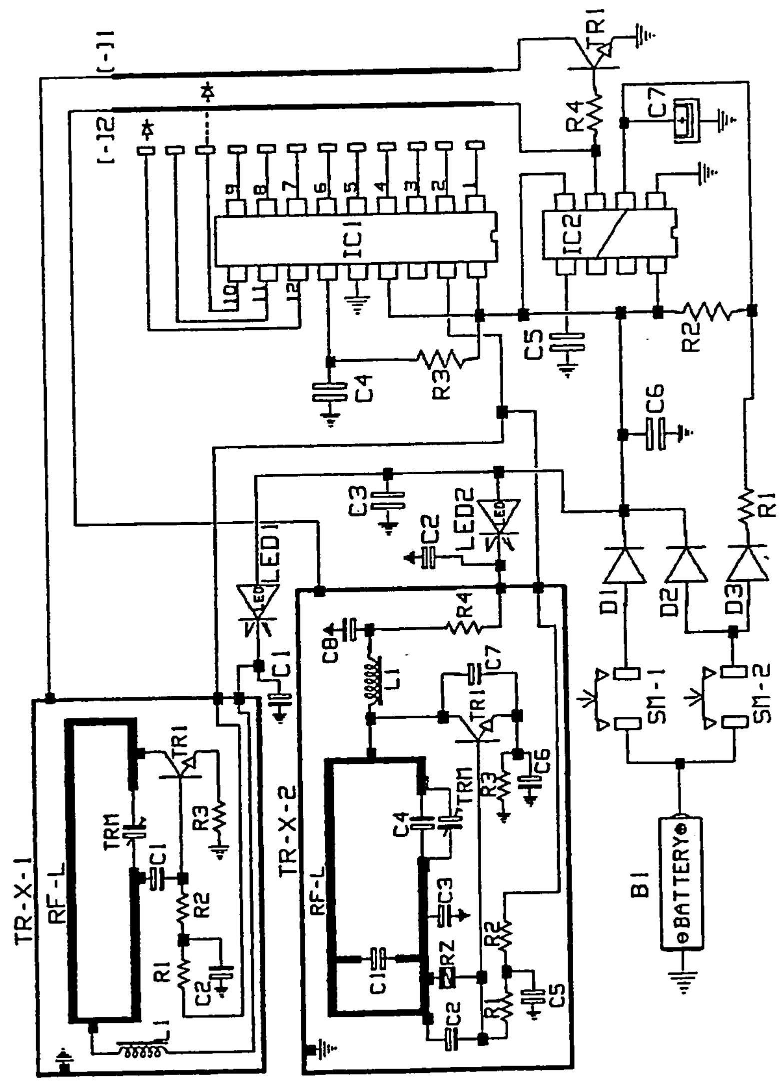

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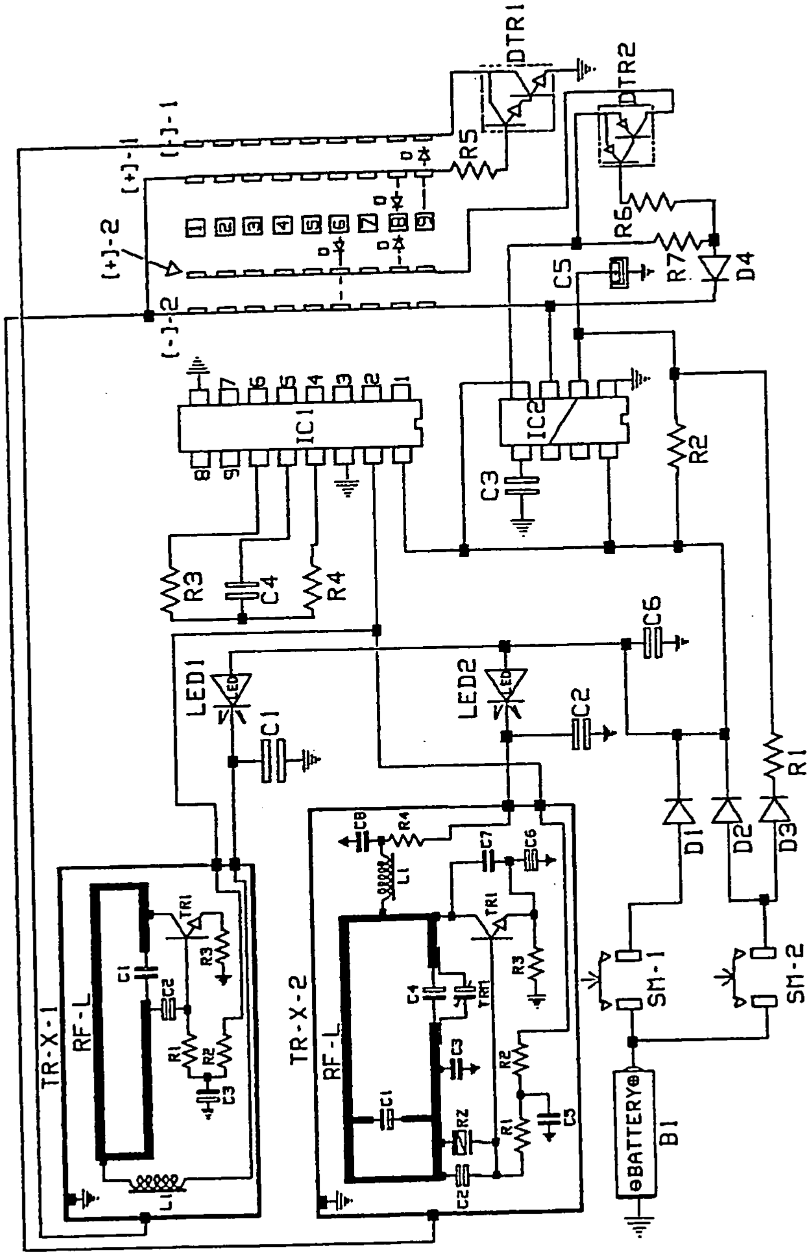

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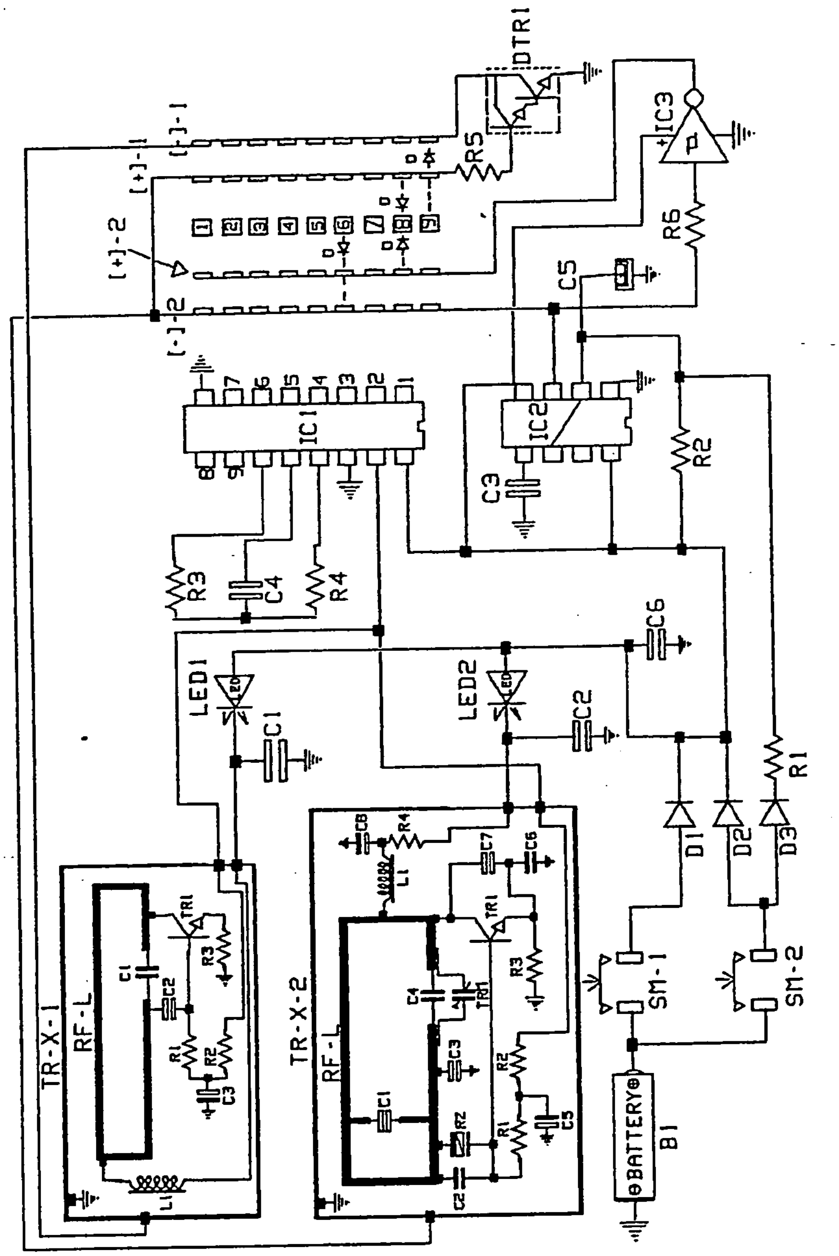

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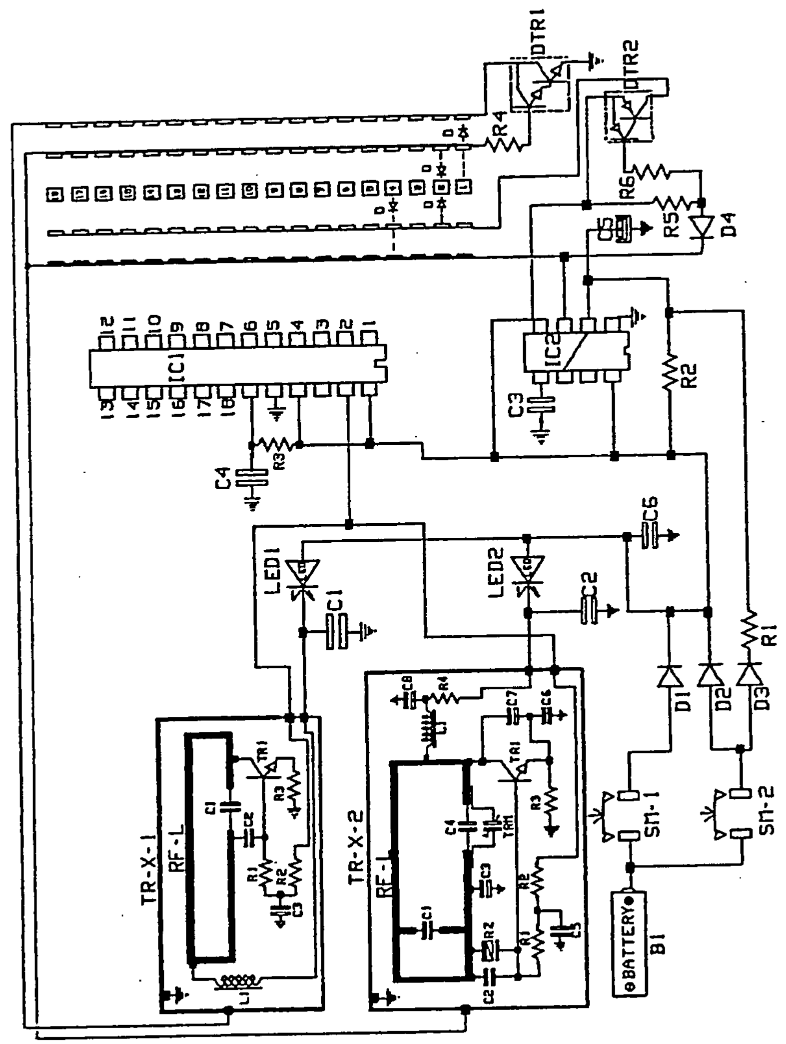

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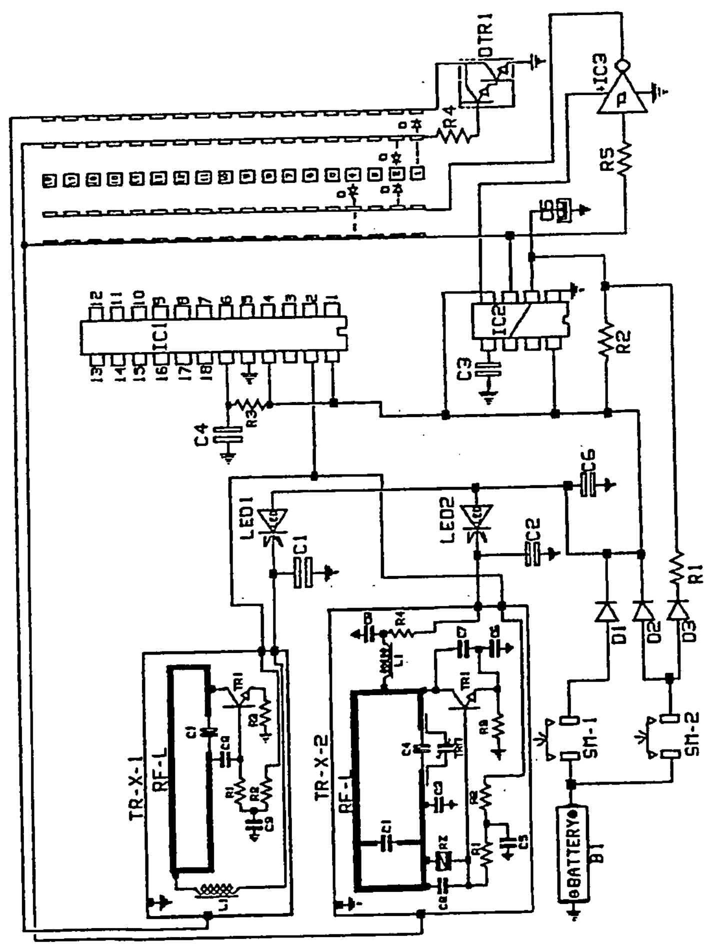

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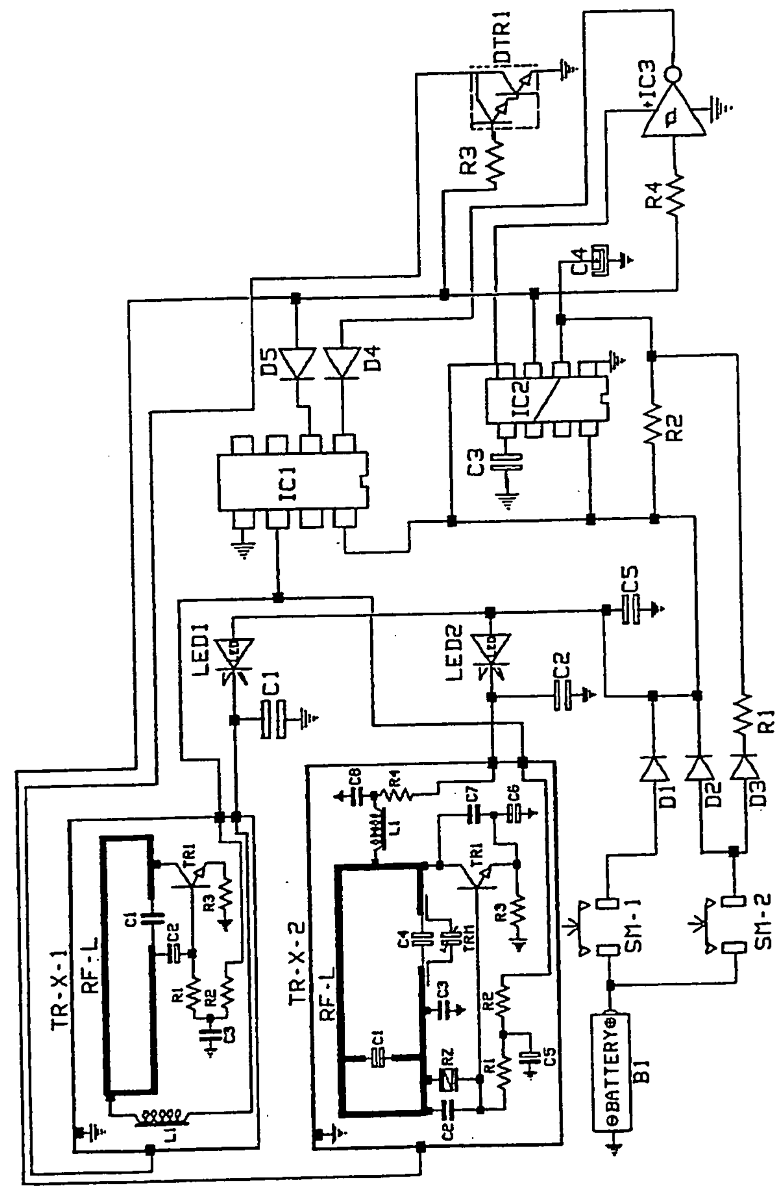

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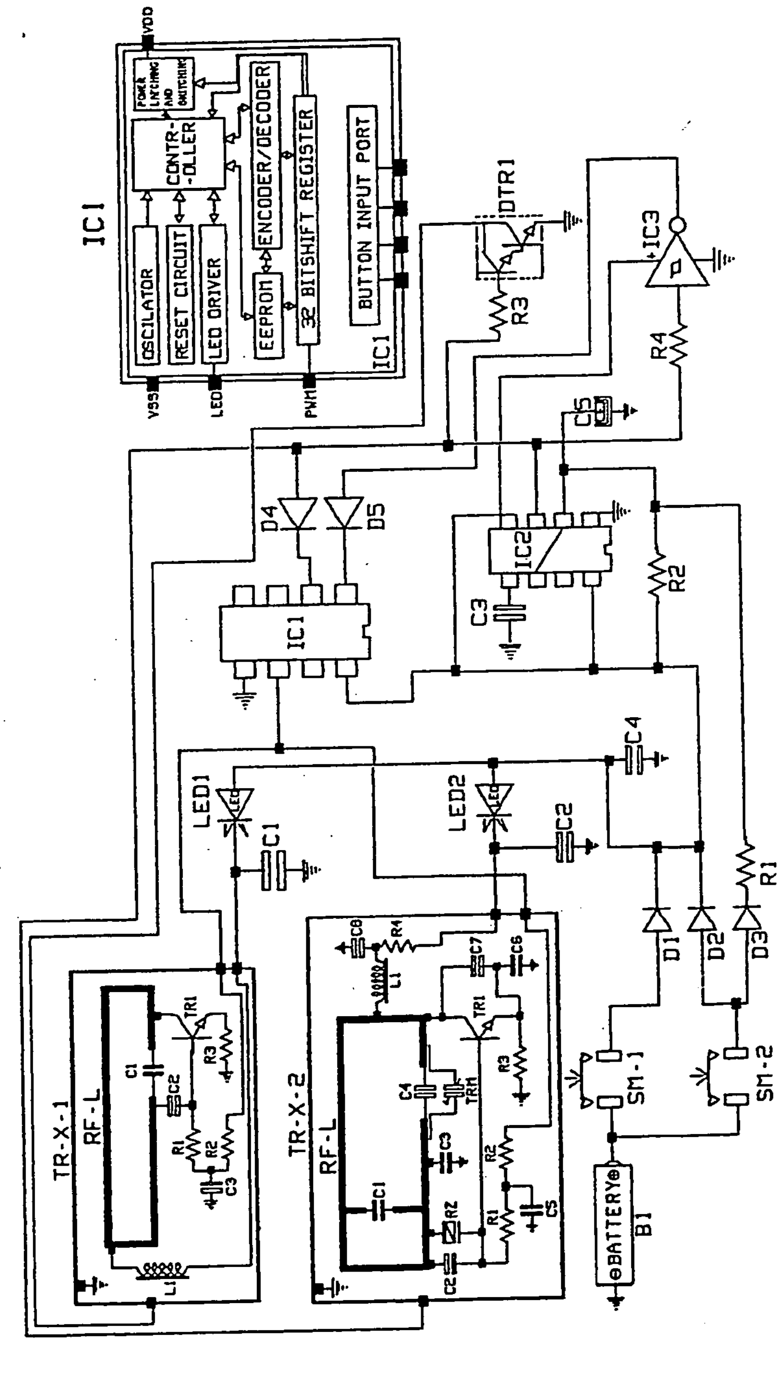

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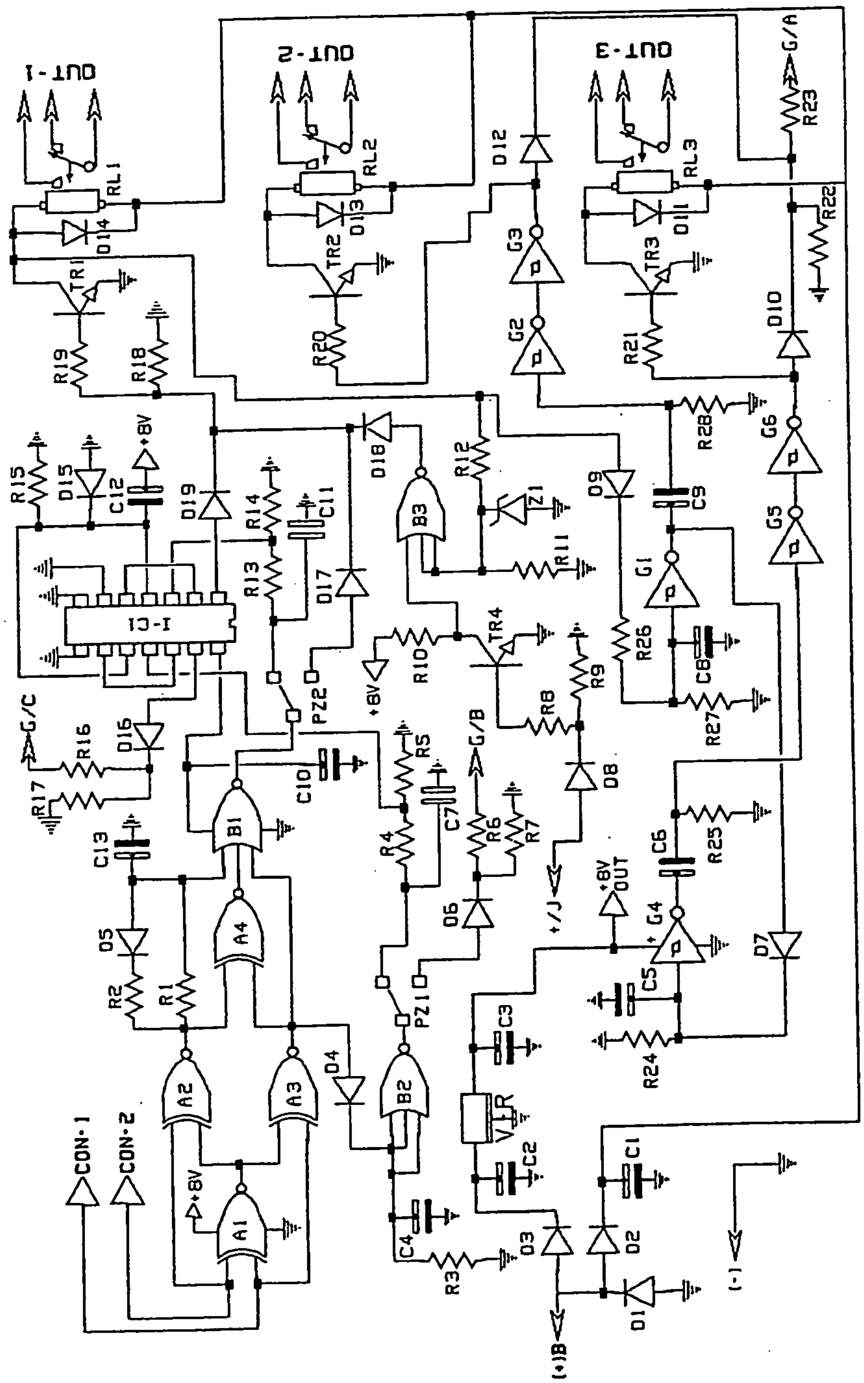

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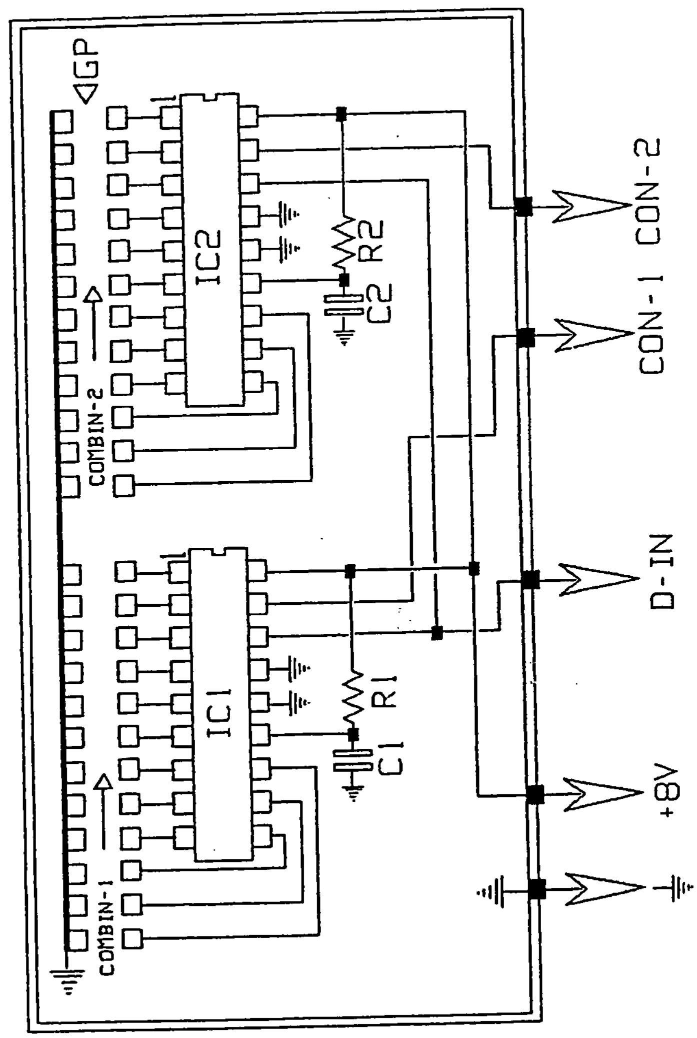

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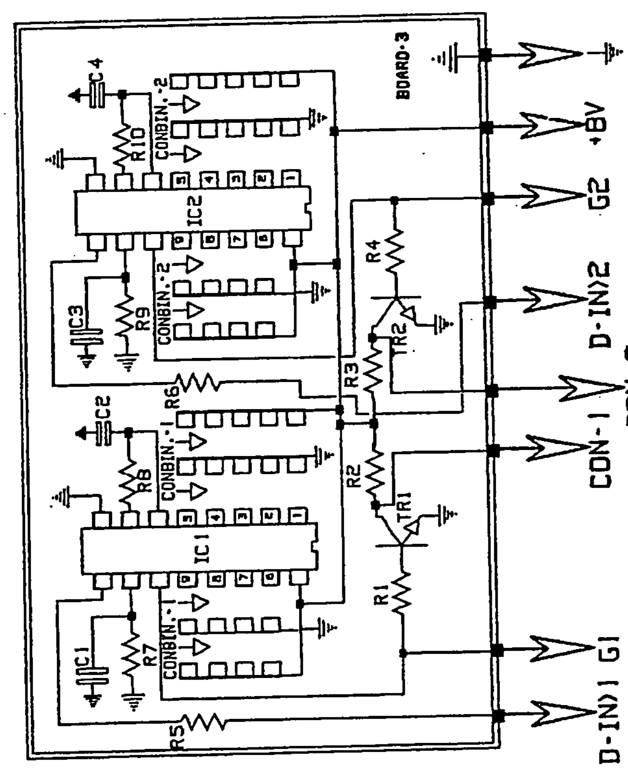

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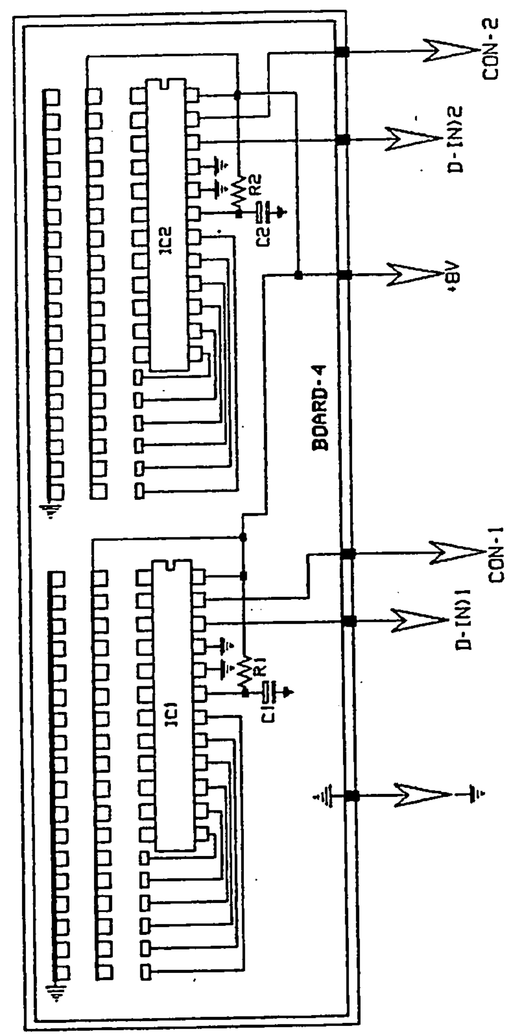

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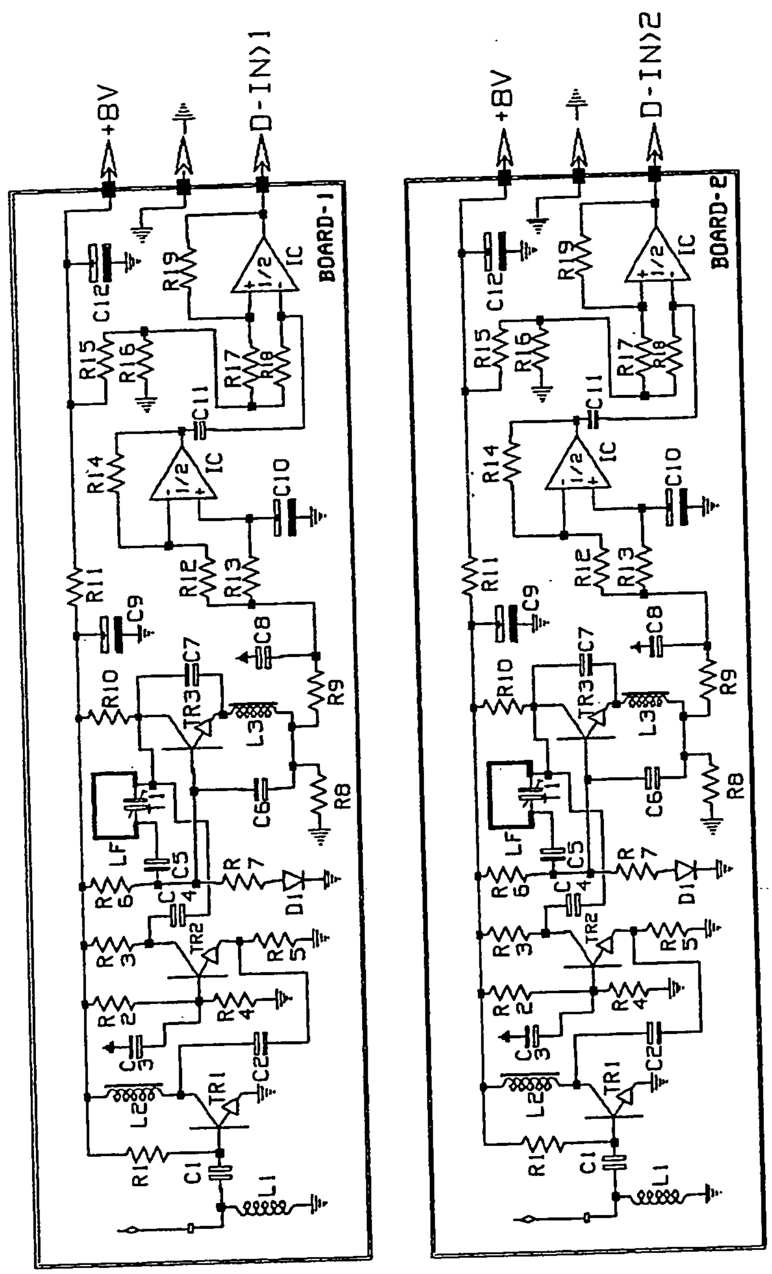

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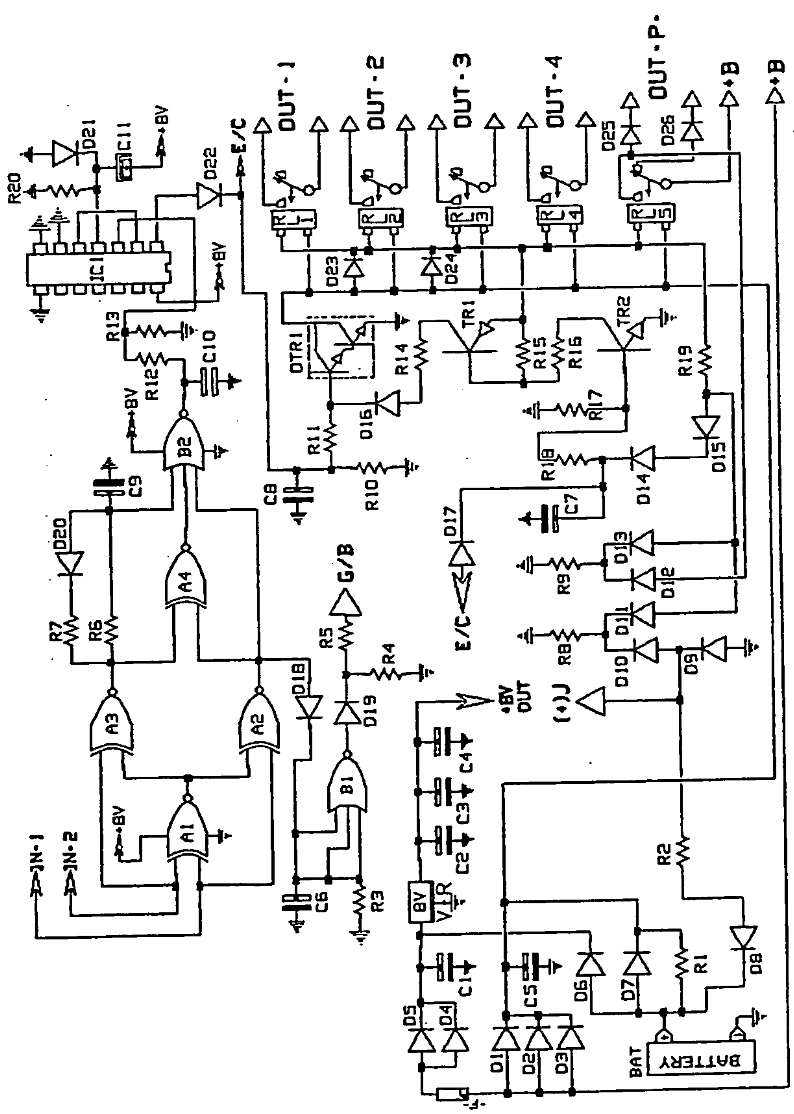

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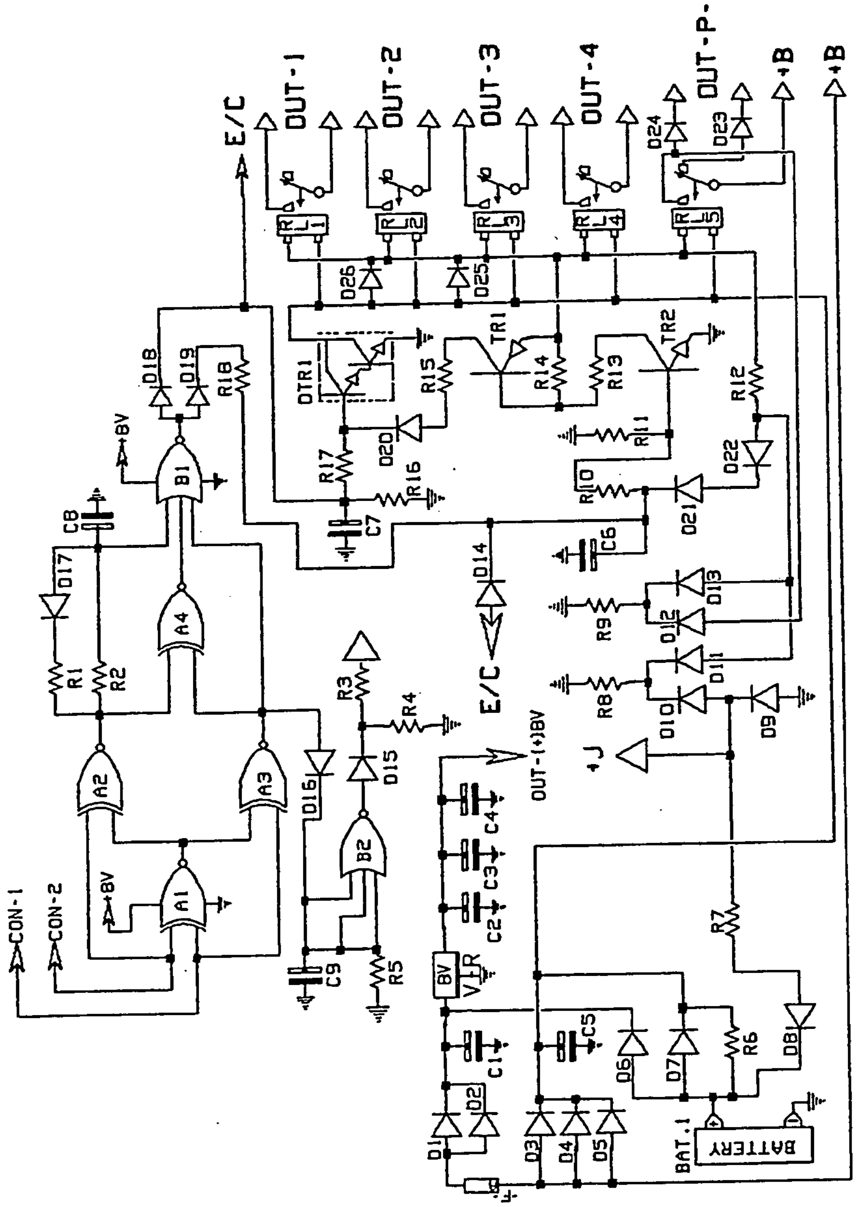

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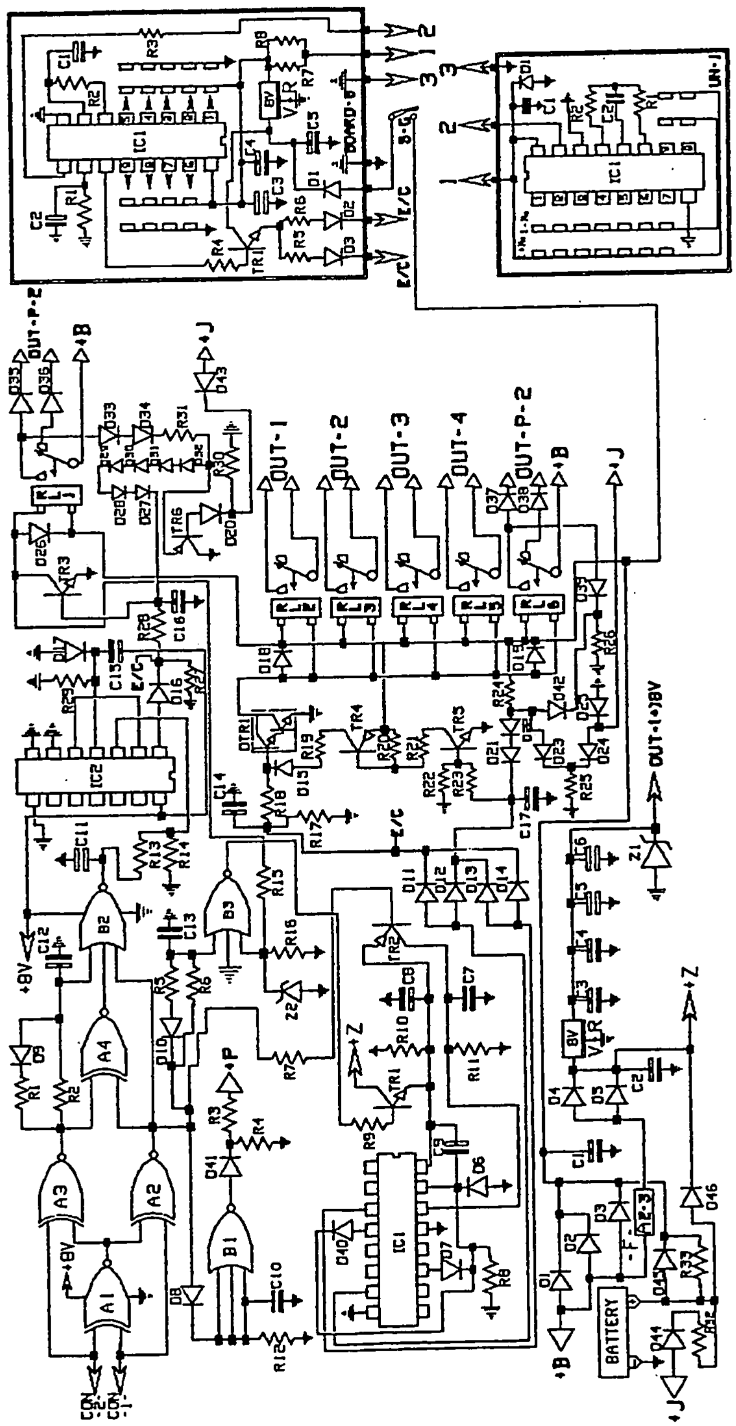

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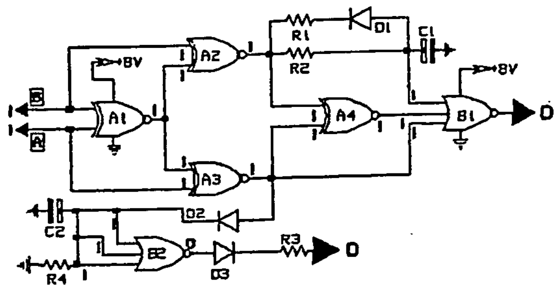
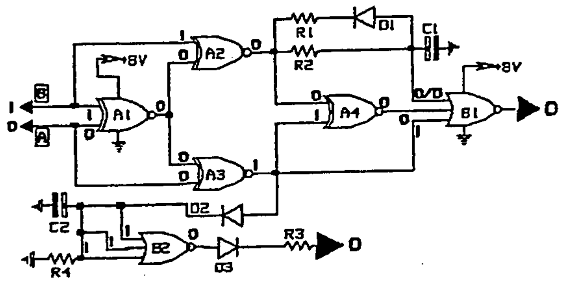


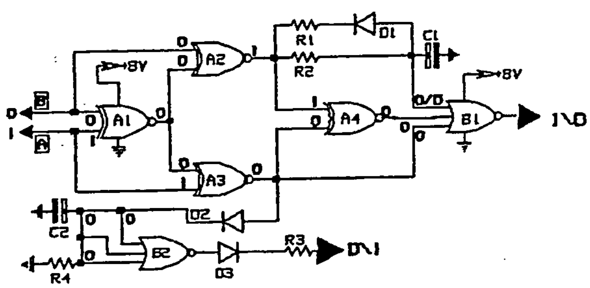
A1
A2
A3
A4
B1
B2
R1
R2
R3
R4
D1
D2
D3
C1
C2
8V

<A



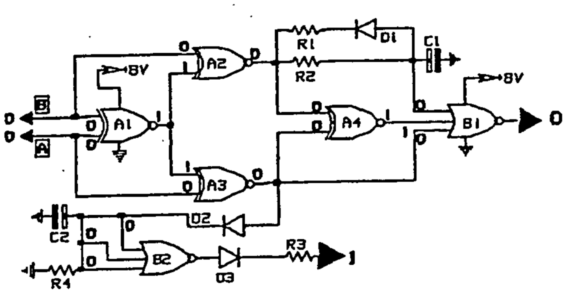
A1
A2
A3
A4
B1
B2
R1
R2
R3
R4
D1
D2
D3
C1
C2
8V

<B



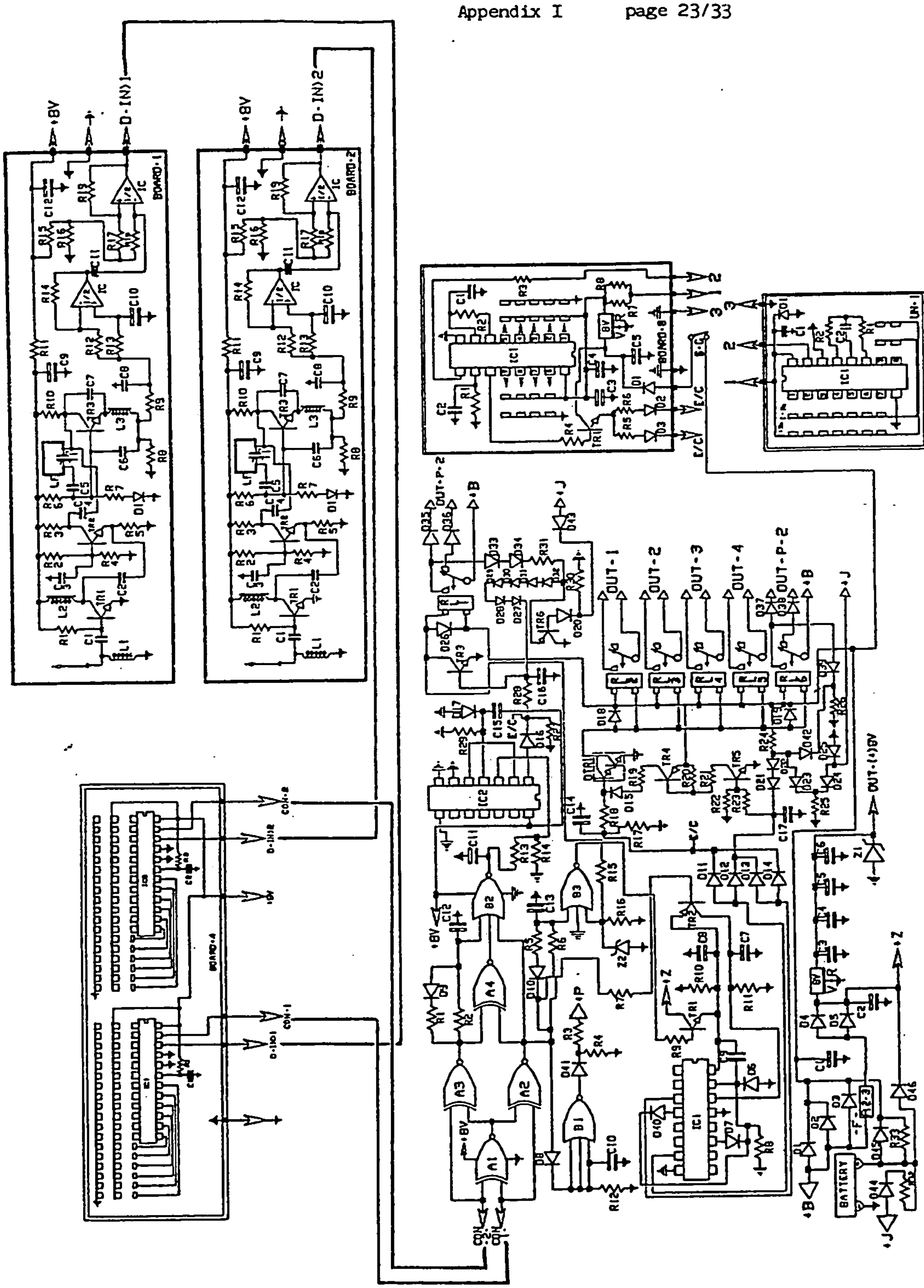
A1
A2
A3
A4
B1
B2
R1
R2
R3
R4
D1
D2
D3
C1
C2
8V

<C

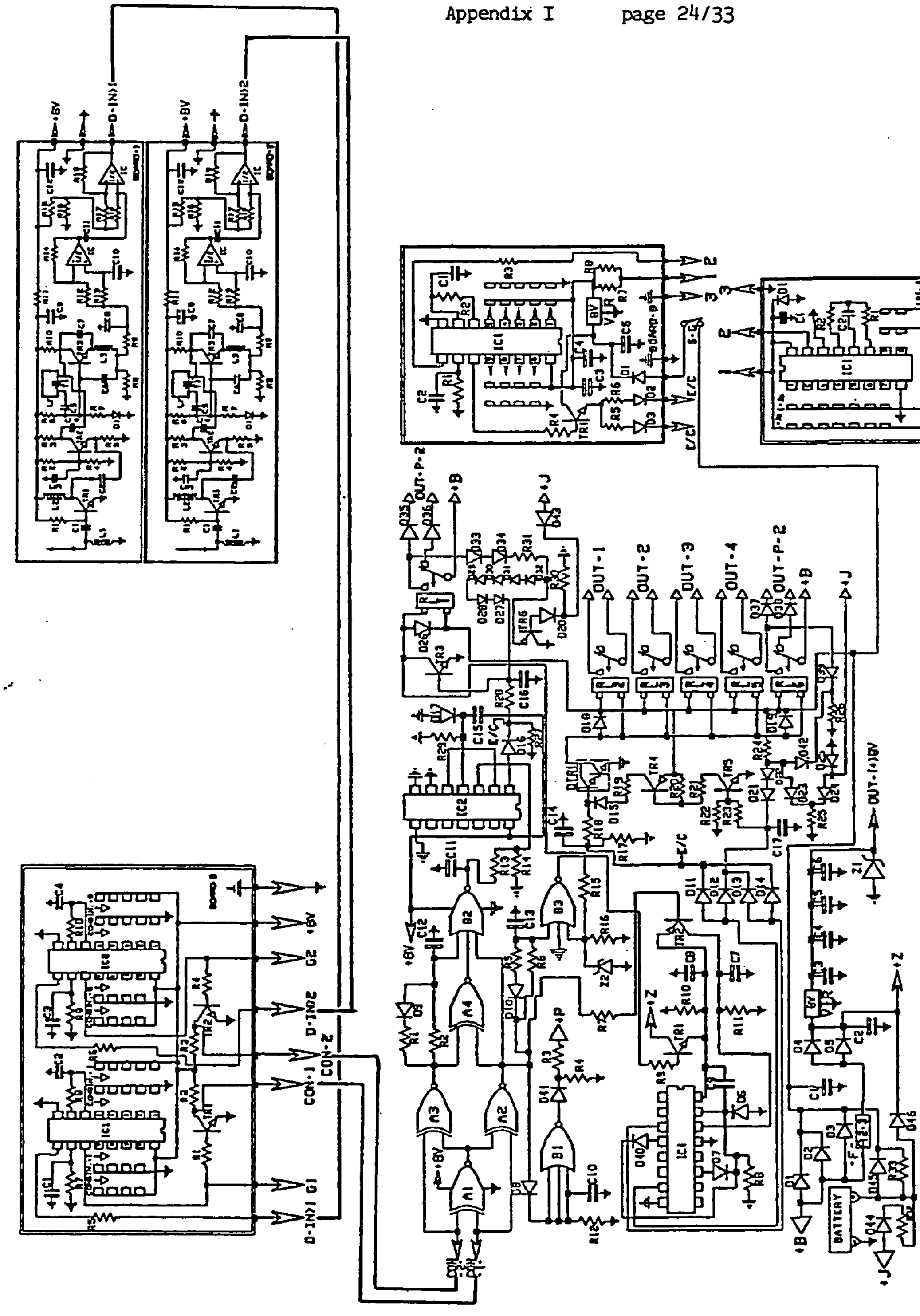


A1
A2
A3
A4
B1
B2
R1
R2
R3
R4
D1
D2
D3
C1
C2
8V

<D



CIRCUIT DIAGRAM (1/A)



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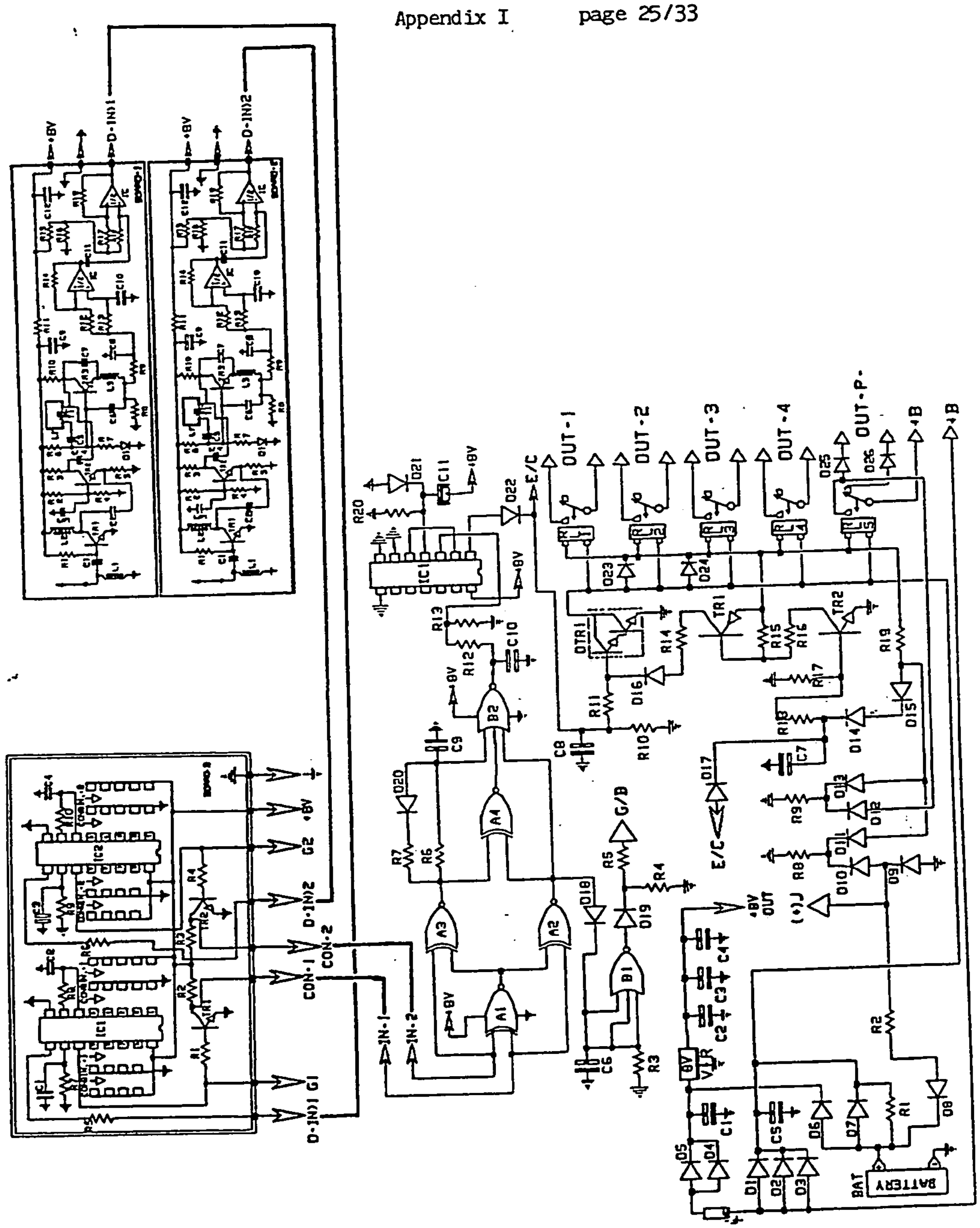

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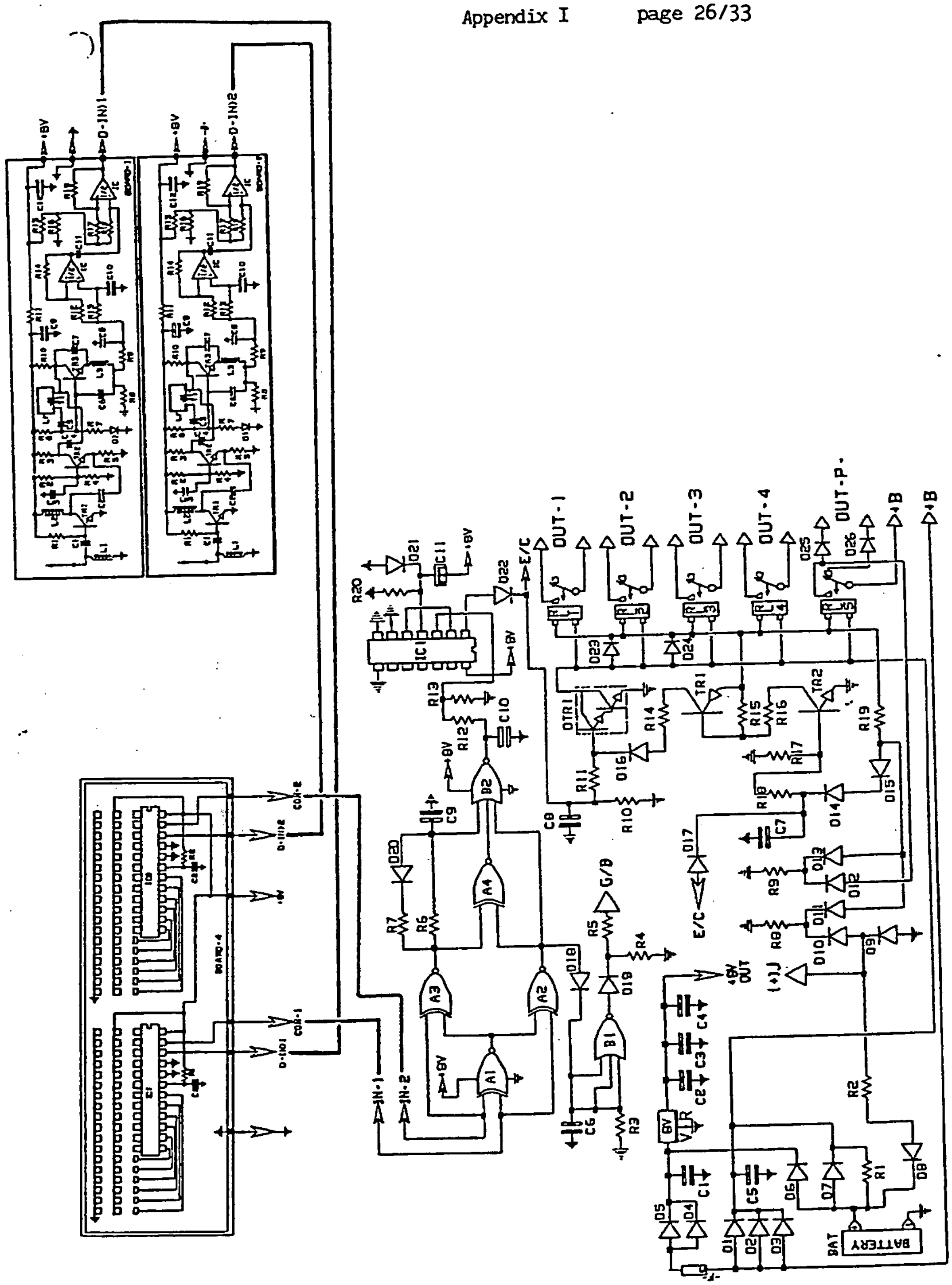

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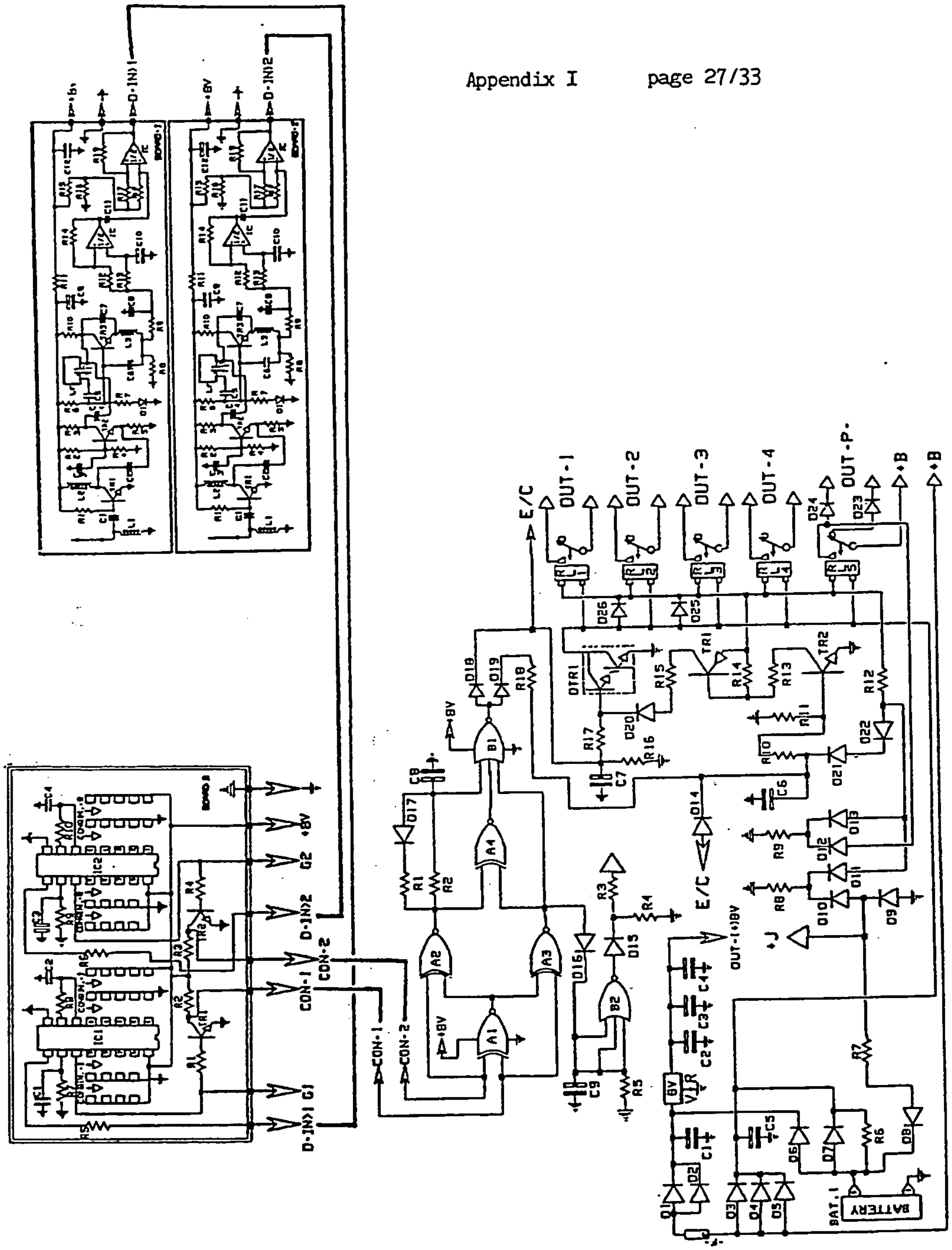

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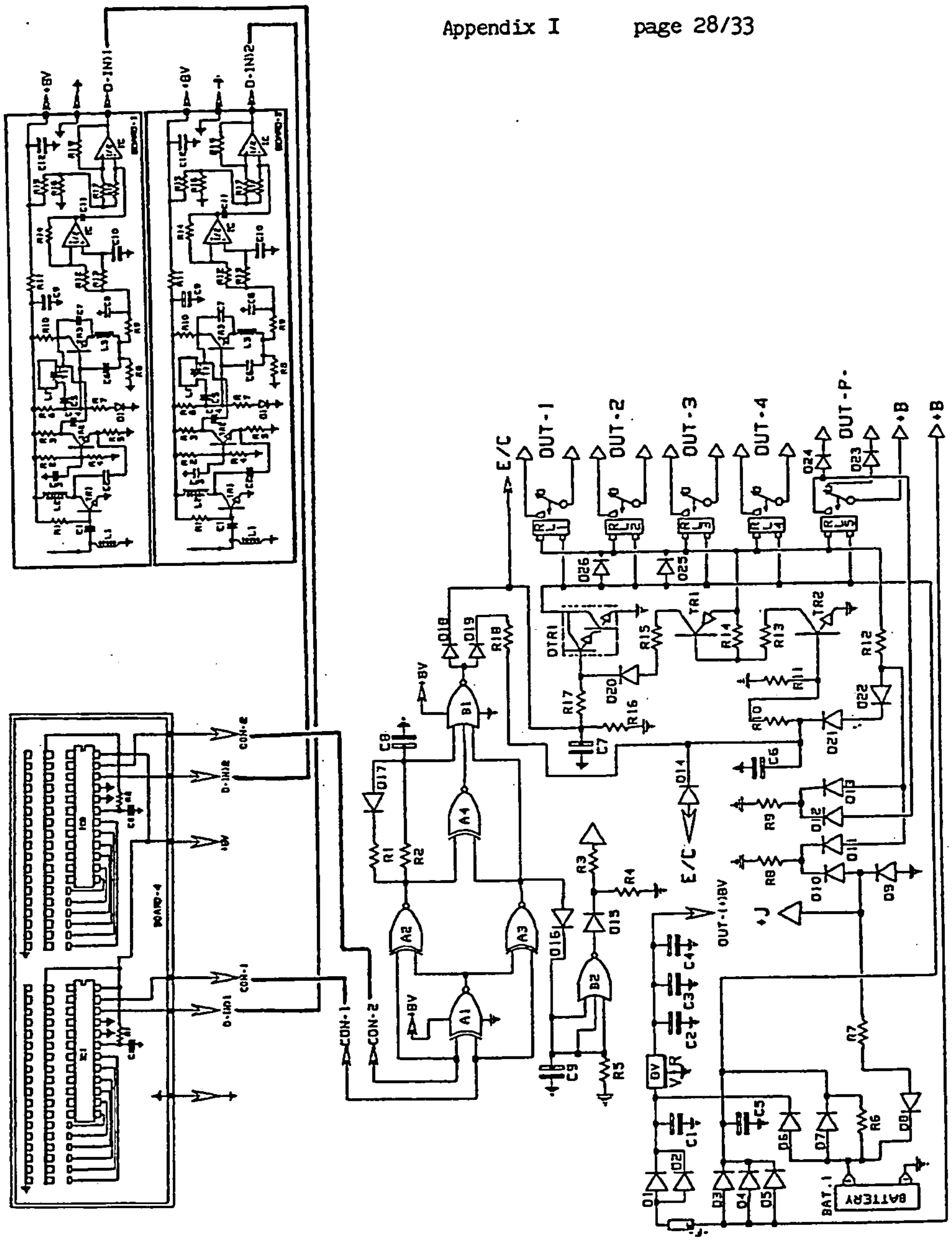
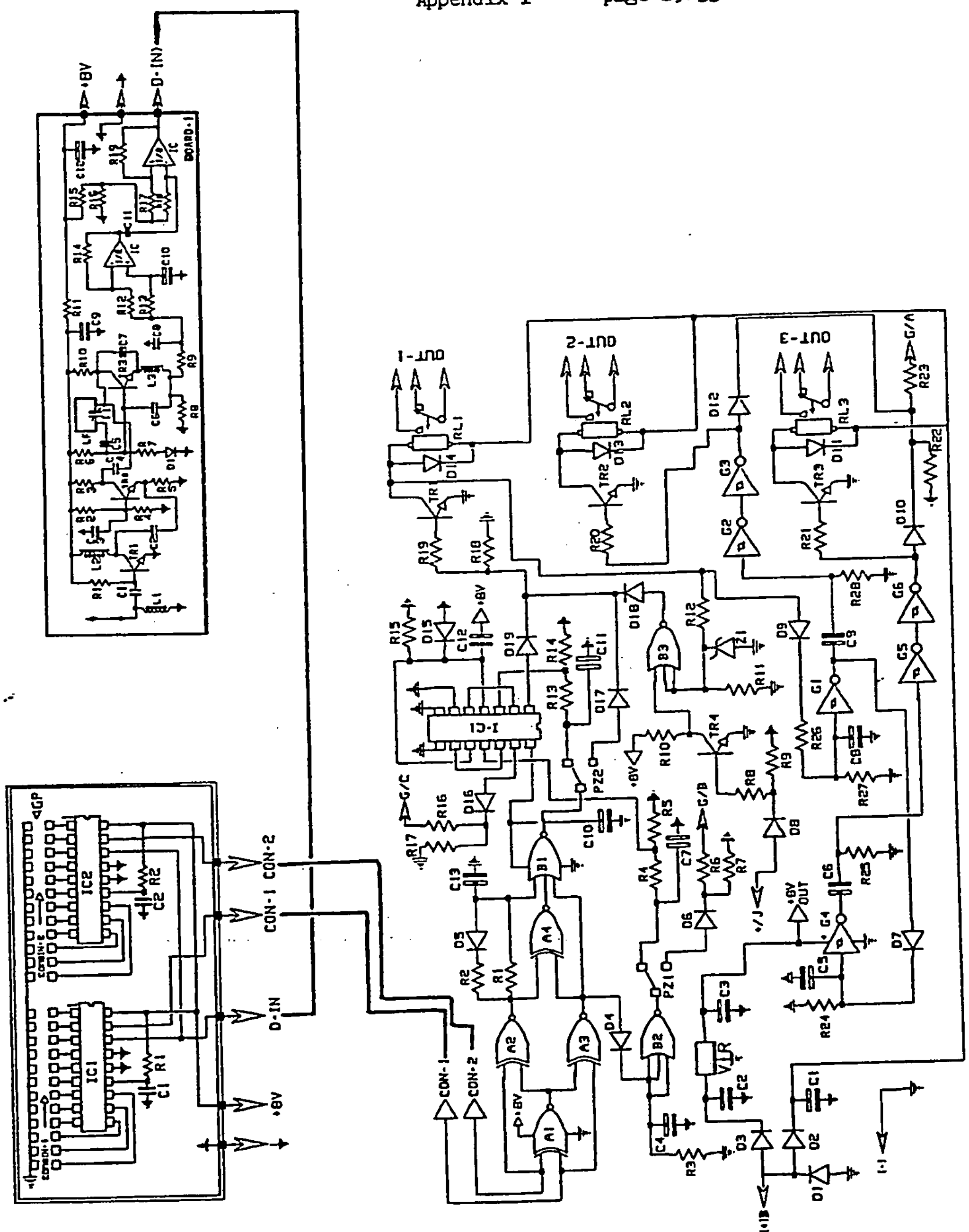
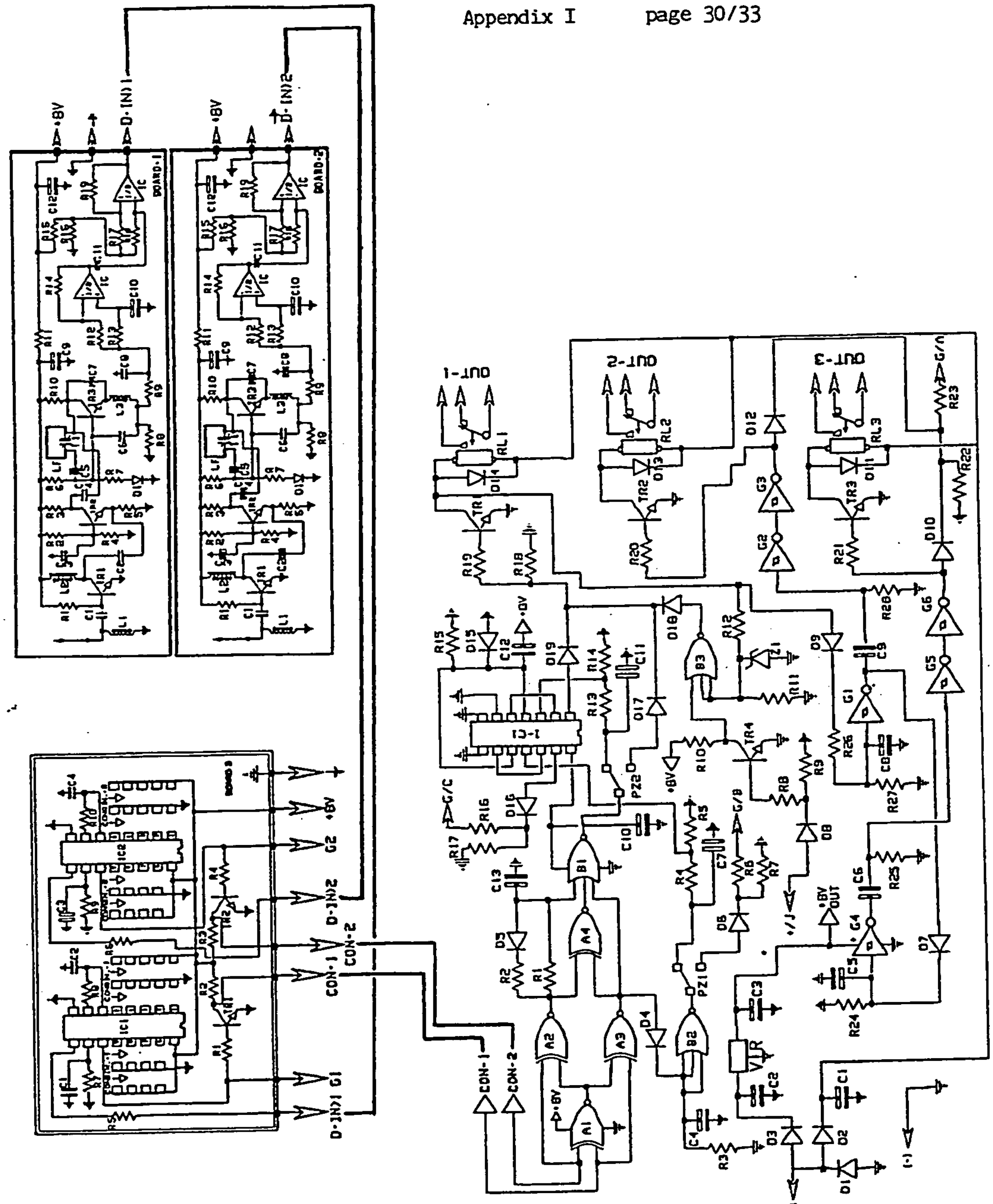


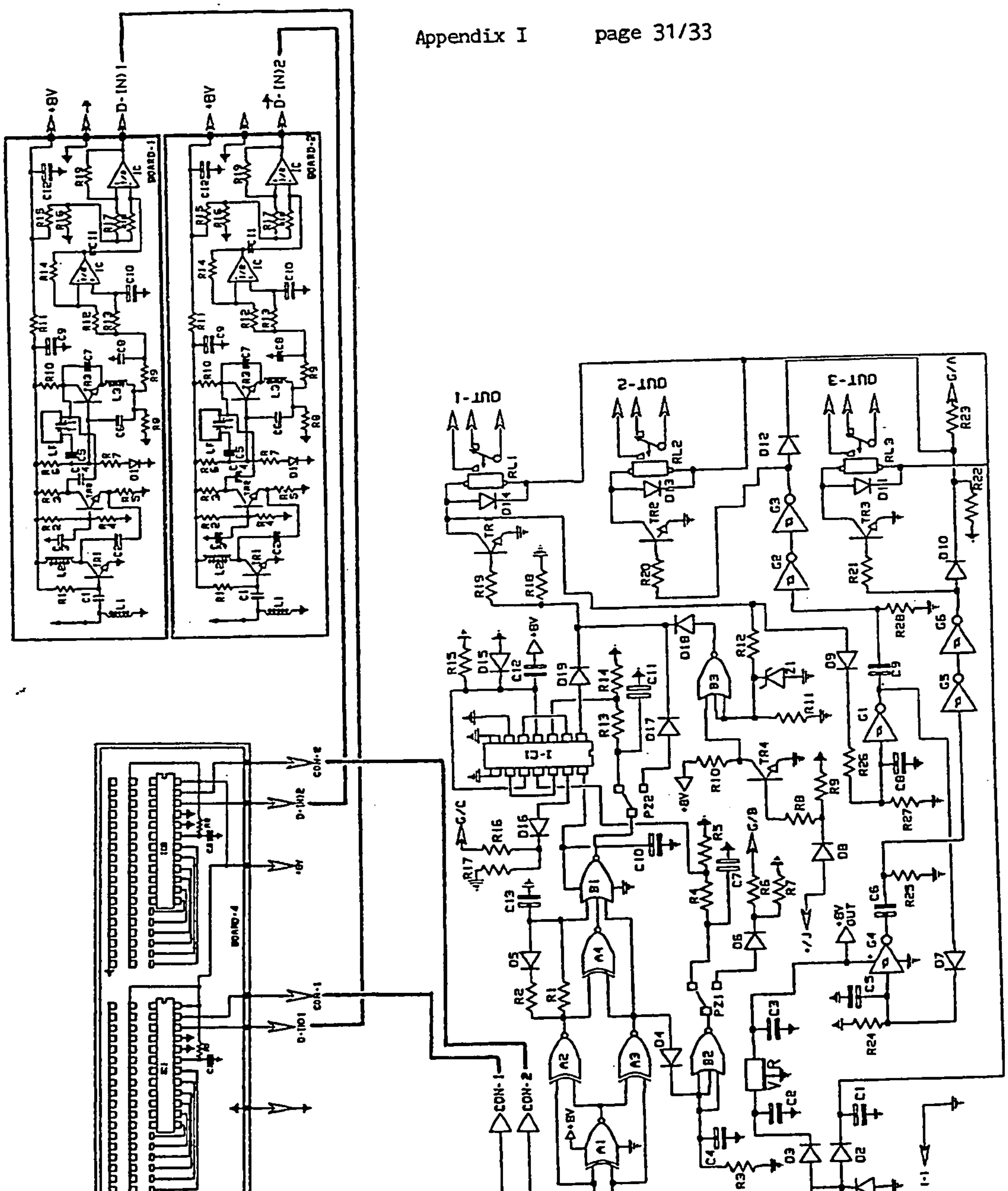
CIRCUIT DIAGRAM (3B)



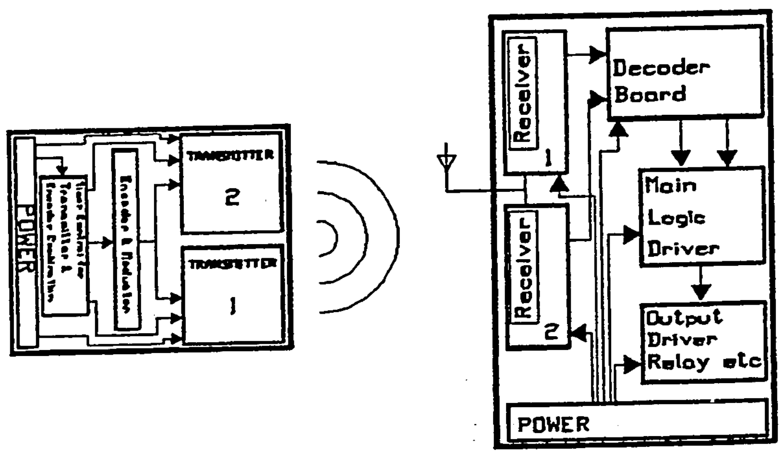
CIRCUIT DIAGRAM (4A)

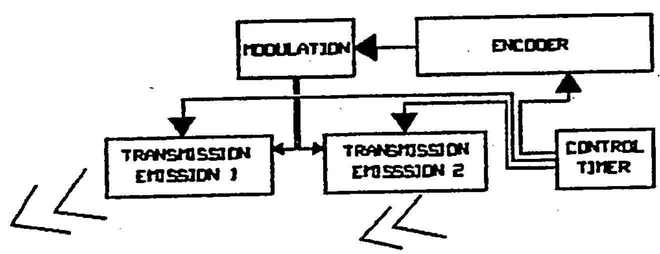


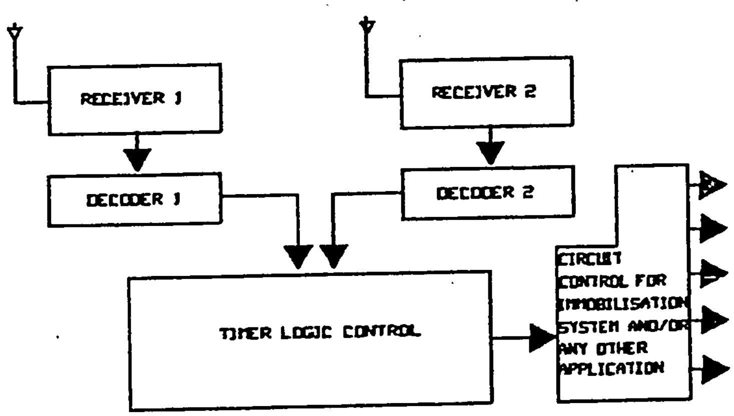
CIRCUIT DIAGRAM (4B)



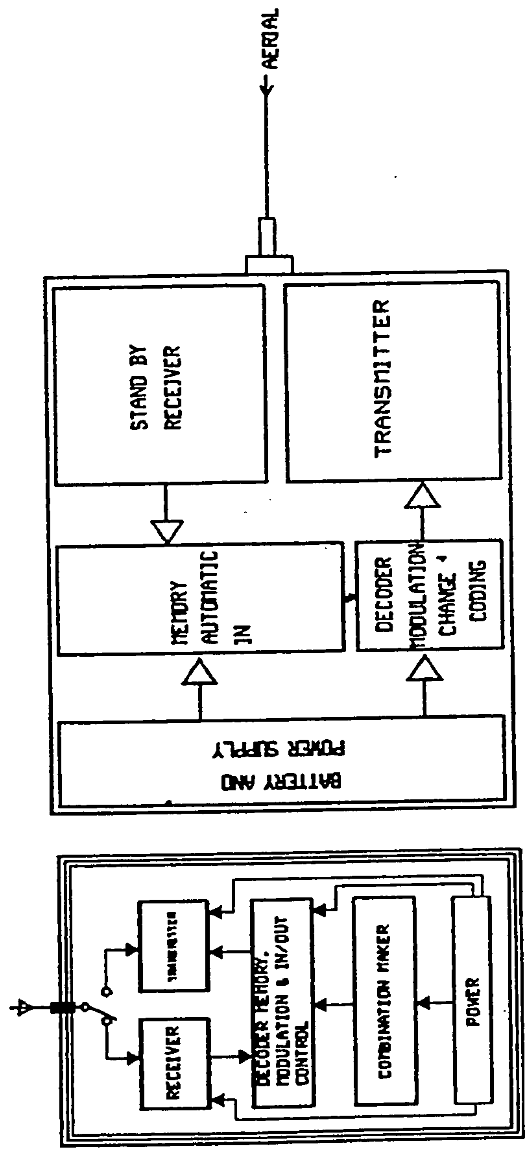
CIRCUIT DIAGRAM (4C)


POWER
TRANSMITTER
2
TRANSMITTER
1
Receiver
1
Receiver
2
Decoder
Board
Main
Logic
Driver
Output
Driver
Relay etc
POWER


MODULATION
ENCODER
TRANSMISSION
EMISSION 1
TRANSMISSION
EMISSSION 2
CONTROL
TIMER


RECEIVER 1
RECEIVER 2
DECODER 1
DECODER 2
TIMER LOGIC CONTROL
CIRCUIT
CONTROL FOR
IMMOBILISATION
SYSTEM AND/OR
ANY OTHER
APPLICATION

GENERAL SCANNER/GRABBER WITH AUTOMATIC STAND BY RECEIVER AND DATA TRANSMITTER OUT



PATENT APPLICATION

TITLE OF INVENTION: Multi-Purpose Remote Control Radio Key with infinite code combination and ultimate protection against decoding and accessing of codes by any method including high-tech. RF scanners, 'grabbers' and radio frequency receivers.

All radio remote control keys basically operate with one Radio Frequency (RF). The value of this RF emission frequency depends on the country, for example the United Kingdom presently has 418MHz. However if the country does not have any RF emission frequency regulations, the frequency can be set at whatever frequency is desired. The RF circuit emission is AM or FM modulation using one encoder I.C. and this I.C. makes the code combination and data output. It can make any number of code combinations.

A number of companies are trying to protect their remote control code combinations and data by using various techniques which include multi-code combinations, random coding, code encryption, algorithm combinations etc. However, whatever is done with a relatively basic I.C. encoder it is still possible to obtain another person's remote control combination either accidentally or intentionally using many sophisticated methods. With sophisticated encoder I.C.'s it is still possible to obtain another person's remote control code using high-tech memory scanning devices that incorporate microprocessor scramblers, etc. as shown in Appendix I, page 33/33.

DESCRIPTION

MULTI-PURPOSE REMOTE CONTROL RADIO KEY

The idea behind this invention is to protect the remote control code combination data from accidental and intentional accessing. Firstly it protects the remote control code combination by using data and the national RF frequency of the country and, secondly it protects the code combination and data from high-tech. scanners and for this we use a minimum of two RF frequencies, i.e., the national RF frequency of the country plus one or more extra RF frequency. This is shown on the Example Circuit Diagram in App. I, page 31/33. The philosophy is that one encoder I.C. and one RF transmission is used, as shown on Circuit Diagram 1 in App. I, page 1/33. (The U.K. presently has 418MHz). Two decoder I.C.'s are required on the receiver board or one microprocessor with two decoder lines.

The idea behind the circuits shown in App. I, pages 1/33 and 22/33 - 'A', 'B', 'C' and 'D' is to give total protection for the remote control data code combination even when the most basic encoder/decoder I.C.'s are used.

This philosophy offers the ultimate protection against both accidental or intentional code accessing.

The philosophy is to protect any remote control combination against the most sophisticated, high-tech. memory scanning devices, as shown in App. I, pages 32/33 and 33/33. This is done by cutting half of the combination or data and then transmitting this with an RF frequency of any value (in the U.K. this is presently 418MHz) and afterwards the rest of the combination or data with second RF transmission is transmitted on a totally different RF frequency. The value of the second frequency can be of any value but must be different to the value of the first transmission. A minimum of two radio frequencies (RF) are used dependent upon the level of protection that is required and dependent upon the number of channels that are operated. This is shown in App. I, pages 32/33 and 33/33.

Anybody with a scanner of course realises the national RF frequency of the country (i.e., U.K. 418MHz at present) but they would not realise the subsequent RF frequency (or frequencies) of this product's transmission. Therefore in the U.K. a scanner would be set at 418MHz but if a scanner accesses half of the data code combination, immediately afterwards the second half of the data code combination would be required to affect and decode the remote control system.

TECHNICAL DESCRIPTION

Circuit Diagram	1	Appendix I Page 1/33
Circuit Diagram	2	Appendix I Page 2/33
Circuit Diagram	3	Appendix I Page 3/33
Circuit Diagram	4	Appendix I Page 4/33
Circuit Diagram	5	Appendix I Page 5/33
Circuit Diagram	6	Appendix I Page 6/33
Circuit Diagram	7	Appendix I Page 7/33
Circuit Diagram	8	Appendix I Page 8/33
Circuit Diagram	9	Appendix I Page 9/33
Circuit Diagram	10	Appendix I Page 10/33
Circuit Diagram	11	Appendix I Page 11/33
Circuit Diagram	12	Appendix I Page 12/33
Circuit Diagram	13	Appendix I Page 13/33

The above are Circuit Diagrams showing various methods of Radio Frequency (RF) transmission with RF modulation and encoder methods.

Circuit Diagram	15	Appendix I Page 15/33
Circuit Diagram	16	Appendix I Page 16/33
Circuit Diagram	17	Appendix I Page 17/33

The above are various types of Circuit Diagrams showing various decoder methods.

Circuit Diagram	14	Appendix I Page 14/33
Circuit Diagram	19	Appendix I Page 19/33
Circuit Diagram	20	Appendix I Page 20/33
Circuit Diagram	21	Appendix I Page 21/33

The above are Circuit Diagrams showing the main output board, and these are the most important circuits of the logics, A1, A2, A3, A4, B1 and B2. This is the main circuit that, firstly, protects the data code combination against accidental or intentional accessing when only one RF frequency is used (in the U.K. presently 418MHz) and secondly, it gives protection when two or more RF frequencies are used, again for the data code combination and it is also effective against high-tech scanners.

Circuit Diagram	18	Appendix I Page 18/33

The above is a typical board and Circuit Diagram showing two super regenerative receivers.

Circuits A, B, C, and D Appendix I Page 22/33

The above circuits show, a map of how the logics A1, A2, A3, A4, B1 and B2 are operated.

Circuit Diagram 1 Appendix I Page 1/33
Circuit Diagram 2 Appendix I Page 2/33
Circuit Diagram 3 Appendix I Page 3/33
Circuit Diagram 6 Appendix I Page 6/33

The above show various types of transmission with encoders when only one national RF frequency is used.

Circuit Diagram 1 Appendix I Page 1/33

The I.C. 1 (Shown on the above Circuit Diagram) is an encoder I.C. 9-bit, Tri-state with FM modulation.

For I.C. 1 any compatible I.C., or alternatively a microprocessor, can be used. The transmission with the RF transistor (shown as TR1) and the components surrounding it show one typical Radio Frequency (RF) emission circuit and the output Radio Frequency (RF) value is dependent mainly upon which Acoustic wave resonator (Shown as RZ) is used.

Circuit Diagram 2 Appendix I Page 2/33

The above Circuit Diagram is similar to Diagram 1, again using one National (RF) frequency, except that it has AM output modulation.

Circuit Diagram 3 Appendix I Page 3/33

The above Circuit Diagram is similar to Circuit Diagrams 1 and 2, using one National RF frequency, the difference being that instead of using a Darlington transistor (Shown as DTR1) it uses a HEX Inverter Schmitt Trigger (Shown as I.C.3)

Circuit Diagram 6 Appendix I Page 6/33

The above Circuit Diagram is similar to Circuit Diagrams 1, 2 and 3 using one National RF frequency, except that this uses an encoder I.C. 12-single bit, one-state (Shown as I.C.1).

he following is a description when one National RF frequency is used:

Any one receiver on Circuit Diagram 18 and one encoder board shown on the Circuit Diagrams 15, 16 or 17 must be used and these are joined with one of the boards shown on Circuit Diagrams 19, 20 and 21.

Circuit Diagram	**4**	**Appendix I Page 4/33**
Circuit Diagram	**5**	**Appendix I Page 5/33**
Circuit Diagram	**7**	**Appendix I Page 7/33**
Circuit Diagram	**8**	**Appendix I Page 8/33**
Circuit Diagram	**9**	**Appendix I Page 9/33**
Circuit Diagram	**10**	**Appendix I Page 10/33**
Circuit Diagram	**11**	**Appendix I Page 11/33**
Circuit Diagram	**12**	**Appendix I Page 12/33**
Circuit Diagram	**13**	**Appendix I Page 13/33**

The above are Circuit Diagrams that use two different Radio Frequencies (RF). RF-L-1 (as shown on the Diagrams) is the National frequency circuit and RF-L-2 can be any value of Radio Frequency.

On the National Radio Frequency (RF) (Shown as RF-L-1), an acoustic wave resonator is used to stabilise the RF output exactly. Typically acceptable is $\pm$ 100KHz. The Radio Frequency output, RF-L-2, must be $\pm$ 1 - 3MHz. Radio Frequency emission RF-L-2, (as shown on Circuit Diagrams 4, 5, 7, 8, 9, 10, 11, 12 and 13) is designed to have an adjustable balance $\pm$ 1 - 3MHz and this balance is dependent upon the voltage of the battery (Shown as B1) and it is also dependent upon how the Remote Control Transmitter is operated/handled. This is essential because if somebody tries to scan the Radio Frequency, RF-L-2, firstly, if the exact value of the Radio Frequency is realised, it is not be possible to receive the exact data code combination and secondly, the value of the Radio Frequencies would not be known as they are changed frequently during the manufacture of this product.

This is brought about by the Radio Frequency value output being dependent upon the size of the RF-L-2, and upon the value of the C9.

All the Circuit Diagrams 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 and 13 show many applications of how to use different sorts of encoder I.C.'s that start from a very low and go up to a very high data code combination. These encoder I.C.'s have bridges and are not computer programmed.
A very large data code combination is shown on Circuit Diagram 11; an encoder I.C. is used with an 18-bit tri-state combination. Each line gives a data code combination of minimum 300,000. A larger data code combination is shown on Circuit Diagrams 12 and 13. These are computer programmed 32-bit encoder I.C.'s. Each line gives a data code combination of minimum 3 trillion.

Circuit Diagram 1A) in App. I, page 23/33 shows one complete receiver and operation system. It shows how board 4 on Circuit Diagram 17, in App. I, page 17/33, is used. The system also shows receiver boards 1 and board 2. These boards with component values are clearly shown on Circuit Diagram 18 in App. I, page 18/33.

Board 8 and the UN-1 on Circuit Diagram 1A) in App. I, page 23/33, is a typical override key circuit device that can be used either in an emergency or if somebody does not wish to use the remote control.

To operate the system shown on Circuit Diagram 1A) in App. I, page 23/33 the transmission shown on Circuit Diagram 10 in App. I, page 10/33, or the transmission shown on the Circuit Diagram 11 in App. I, page 11/33, can be used. On the Circuit Diagram 1A) in App. I, page 23/33, the receiver on board 2 is the receiver that receives the national RF frequency, the receiver board 1 is the receiver that receives any value RF frequency.

The series of the transmission is shown on the Circuit Diagram 10 in App. I, page 10/33, and Circuit Diagram 11 in App. I, page 11/33, i.e., TR-X-1 transmission transmits firstly any value RF frequency that the manufacturer sets up and afterwards, dependent upon the value of the R2 and C5, the TR-X-2 is then set to transmit the National RF frequency of the country.

The timing of the transmissions must be synchronised as shown on Circuit Diagram 10 in App. I, Page 10/33, and Circuit Diagram 11 in App. I, page 11/33. The value of R2 and C5 must

synchronise with the value of the components R1, R2 and C12 of the logics A4 and B2 shown on Circuit Diagram 1A) in App. I, Page 23/33. This is essential to ensure that all the timing is synchronised.

The remainder of the components on Circuit Diagram 1A) in App. I, page 23/33, i.e., the I.C.1 and I.C.2 and the surrounding components can make any automation that is required. Circuit Diagram 1B) in App. I, page 27/33 is a similar Circuit Diagram to 1A) in App. I, page 23/33 except that this shows how to use different decoder boards. This uses decoder board 3 shown on Circuit Diagram 16 in App. I, page 16/33. Decoder board 3 on Circuit Diagram 1B) in App. I, page 24/33, can use any of the transmission systems shown on the following Circuit Diagrams:

Circuit Diagram	**4**	**Appendix I Page 4/33**
Circuit Diagram	**5**	**Appendix I Page 5/33**
Circuit Diagram	**8**	**Appendix I Page 8/33**
Circuit Diagram	**9**	**Appendix I Page 9/33**

Circuit Diagrams 2A) in App. I, page 25/33 and 2B) in App. I, page 26/33 are similar circuits to 1A and 1B in App. I pages 23/33 and 24/33 with double receivers and boards 3 and 4. On boards 3 and 4 the same transmission circuit is used as is used on Circuit Diagrams 1A and 1B except that this circuit does not have as much automation as Circuits 1A) and 1B).

On Circuits 2A and 2B) the logic B2 operates the I.C.1 flip-flop and the flip-flop switches all the circuit relays 'on' and 'off'.

Circuit Diagrams 3A) and 3B) show receiver encoders and transmission operation. These circuits operate in a similar way to Circuits 1A), 1B, 2A) and 2B) except that the logic B1 operates the output relays and after a certain time the relays return to the 'standby' position, as shown on these Circuit Diagrams, 3A) and 3B). The length of time that the relay takes to switch from position '1' back to position '0' is dependent upon the value of the timer capacitor, C6, on the Circuit Diagrams 3A) and 3B).

At the points shown as E/C on the Circuit Diagrams 2A), 2B), 3A) and 3B) any override key system can be fitted as shown on the Circuit Diagrams 1A) and 1B).

Circuit Diagram 4A) in App. I, page 29/33, shows how to protect one Radio Frequency transmission by using one receiver and one decoder board from Circuit Diagram 15 in App. I, page 15/33. With this a transmission operation from Circuit Diagram 6 in App. I, page 6/33, can be used. An encoder/decoder board can also be used as long as it is fitted in the position shown on Circuit Diagram 15 in App. I, page 15/33. Circuit Diagram 4A) is used if you are not worried about high-tech. radio frequency scanners but are worried about accidental or intentional accessing of the data code combination.

The receiver and transmission can be set at the National RF frequency or any RF frequency that is desired.

Circuit Diagrams 4B) and 4C) in App. I, pages 30/33 and 31/33 ,are similar to Circuit Diagrams 1A), 1B), 2A), 2B), 3A) and 3B). Circuit Diagrams 4B) and 4C) operate with two receivers and, depending on the decoder board used, the appropriate transmission and encoder circuit is used as shown on Circuit Diagram 1A), 1B), 2A), 2B), 3A) and 3B).

The battery shown on Circuit Diagrams 1A), 1B), 2A) , 2B), 3A) and 3B) is used to protect the relay output from 'arc' problems as basically these Circuit Diagrams are designed using automotive standard. Should the systems be required for different applications it is not necessary to fit the battery. The battery offers protection and it 'holds' the relay for a few seconds after a vehicle ignition is started as when a vehicle ignition is started the voltage drop current drops dramatically at this particular moment. The battery protects the relay output against 'ticking' and 'arc'.

The transistors, DTR1, TR4 and TR5, shown on Circuit Diagrams 1A), 1B), 2A), 2B), 3A) and 3B), together with the surrounding components 'hold' and protect the output relay when the vehicle is motoring.

dramatically at this particular moment. The battery protects the relay output against 'ticking' and 'arc'.

The transistors, DTR1, TR4 and TR5, shown on Circuit Diagrams 1A), 1B), 2A), 2B), 3A) and 3B), together with the surrounding components 'hold' and protect the output relay when the vehicle is motoring.

The B1 logic together with the surrounding components shown on Circuit Diagrams 1A), 1B), 2A), 2B), 3A) and 3B) can be used as an alarm panic line. Also if somebody used a high-tech RF scanner and 'grabs' the last radio data code combination and tries to operate the system, the alarm siren would start to sound.

For the logics A1, A2, A3 and A4 with B1, B2 and B3 any compatible I.C. can be used or this can be made using any micro-controller or micro-processor in order to bring about this idea of 2 Radio Frequencies, i.e. 1 ÷ 1, as analysed on Circuits A, B, C & D in App. I, page 22/33.

On all the circuits the standards are for automotive applications. Depending on the vehicle type it is possible to change the value of the components for use with any particular vehicle.

If not used for automotive applications the value of all the listed components will then change depending on the particular application, e.g. all the output relays of the main board are 10A - 12V. It is possible to change the power rating of the relays to suit any application. Also you can use any different type of RF Radio receivers you require.

In addition, you can replace the encoder and decoder I.C chips with micro-controllers or microprocessors as shown on circuit diagram 13 in App. I, page 13/33.

On circuit diagram 4C in App. I, page 31/33 the Schmitt triggers G1, G2, G3, G4, G5 and G6 and the surrounding components are for automotive application to lock and unlock the vehicle doors. If you require door lock 'delay' you can change the values of R24 and R27 to achieve this.

If used for any application other than automotive you can use this circuit for any automation you wish.

Component Values - Circuit Diagram (1)

B1	12V Battery
C1	1P9
C2	9 - 10pF
C3	1pF
C4	Value depends on dimension of RF - L
C5	3pF
C6	470pF
C7	1nF
C8	100nF
C9	Value depends on data frequency
C10	1μF
C11	100pF
D1	IN4148 diode or any compatible
D2	IN4148 diode or any compatible
D3	IN4148 diode or any compatible
D4	IN4148 diode or any compatible
DTR1	Any Darlington PNP transistor with 10mA current
DTR2	Any Darlington NPN transistor with 10mA current
IC1	145026 encoder or compatible encoder
IC2	555 timer or any timer
L1	1.5μH
LD1	LED 3mm or any compatible
LD2	LED 3mm or any compatible
R1	20K
R2	10K
R3	100R
R4	100R
R5	3K3
R6	Value depends on data frequency
R7	Value depends on data frequency
R8	750K
R9	4K7
R10	10K
R11	10K
R12	10K
RZ	418MHz Acoustic wave resonator or any frequency (depending on requirements of the Country)
SM1 - SM2	Button switches
TR1	MMST918 RF transistor or any compatible

Appendix II

Component Values - Circuit Diagram (2)

B1	12V Battery
C1	1P9
C2	9 - 10pF
C3	1pF
C4	Value depends on dimension of RF - L
C5	3pF
C6	470pF
C7	1nF
C8	100nF
C9	Value depends on data frequency
C10	1µF
C11	100pF
C12	10pF
D1	IN4148 diode or any compatible
D2	IN4148 diode or any compatible
D3	IN4148 diode or any compatible
D4	IN4148 diode or any compatible
DTR1	Any Darlington PNP transistor with 10mA current
DTR2	Any Darlington NPN transistor with 10mA current
ICI	145026 encoder or compatible encoder
IC2	555 timer or any timer
L1	1.5µH
LD1	LED 3mm or any compatible
LD2	LED 3mm or any compatible
R1	20K
R2	10K
R3	100R
R4	100R
R5	3K3
R6	Value depends on data frequency
R7	Value depends on data frequency
R8	750K
R9	4K7
R10	10K
R11	10K
R12	10K
RZ	418MHz Acoustic wave resonator or any frequency (depending on requirements of the Country)
SM1 - SM2	Button Switches
TR1	MMST918 RF transistor or any compatible

Appendix II

Component Values - Circuit Diagram (3)

B1	12V Battery
C1	1P9
C2	9 - 10pF
C3	1pF
C4	Value depends on dimension of RF - L
C5	3P3
C6	470pF
C7	1nF
C8	100nF
C9	Value depends on data frequency
C10	1μF
C11	10pF
C12	100pF
D1	IN4148 diode or any compatible
D2	IN4148 diode or any compatible
D3	IN4148 diode or any compatible
DTR1	Any Darlington NPN transistor with 10mA current
IC1	145026 encoder or compatible encoder
IC2	555 timer or any timer
IC3	HEX inverting schmitt trigger (any type)
L1	1.5μH
LD1	LED 3mm or any compatible
LD2	LED 3mm or any compatible
R1	20K
R2	10K
R3	100R
R4	100R
R5	3K3
R6	Value depends on data frequency
R7	Value depends on data frequency
R8	750K
R9	4K7
R10	47K
R11	10K
RZ	418MHz Acoustic wave resonator or any frequency (depending on requirements of the Country)
SM1 - SM2	Button switches
TR1	MMST918 RF transistor or any compatible

Appendix II

Component Values - Circuit Diagram (4)

B1	12V Battery
C1	1P9
C2	9 - 10pF
C3	1pF
C4	Value depends on dimension of RF - L
C5	10pF
C6	10pF
C7	10nF
C8	Value depends on data frequency
C9	Value depends on data frequency
C10	1nF
C11	3P3
C12	100nF
C13	470pF
C14	Value depends on data frequency
C15	100nF
C16	1μF
D1	IN4148 diode or any compatible
D2	IN4148 diode or any compatible
D3	IN4148 diode or any compatible
D4	IN4148 diode or any compatible
DTR1	Any Darlington NPN transistor with 10mA current
DTR2	Any Darlington PNP transistor with 10mA current
IC1	145026 encoder or compatible encoder
IC2	555 timer or any timer
L1	1.5μH
L2	1.5μH
LD1	LED 3mm or any compatible
LD2	LED 3mm or any compatible
R1	20K
R2	10K
R3	10K
R4	20K
R5	100R
R6	100R
R7	100R
R8	Value depends on data frequency
R9	Value depends on drat frequency
R10	4K7
R11	750K
R12	10K
R13	10K
R14	10K

Component Values - Circuit Diagram (4)

RZ	418mHZ Acoustic wave resonator or any frequency (depending on requirements of the Country)
SM1 - SM2	Button switches
TR1	MMST918 RF transistor or any compatible
TR2	MMST918 RF transistor or any compatible

Component Values - Circuit Diagram (5)

B1	12V Battery
C1	1P9
C2	9 - 10pF
C3	1pF
C4	Value depends on dimension of RF - L
C5	10pF
C6	10pF
C7	10nF
C8	Value depends on RF frequency
C9	Value depends on RF frequency
C10	1nF
C11	3P3
C12	100pF
C13	470pF
C14	Value depends on data frequency
C15	100n F
C16	1μF
D1	IN4148 diode or any compatible
D2	IN4148 diode or any compatible
D3	IN4148 diode or any compatible
DTR1	Any Darlington NPN transistor with 10mA current
IC1	MM53200 or UM3750
IC2	555 timer or any timer
IC3	HEX inverting schmitt trigger (any type)
L1	1.5μH
L2	1.5μH
LD1	LED 3mm or any compatible
LD2	LED 3mm or any compatible
R1	20K
R2	10K
R3	10K
R4	20K
R5	100R
R6	100R
R7	100R
R8	Value depends on data frequency
R9	Value depends on data frequency
R10	4K7
R11	750K
R12	10K
R13	10K

Component Values - Circuit Diagram (5)

RZ	418MHz Acoustic wave resonator or any frequency (depending on requirements of the Country)
SM1 - SM2	Button switches
TR1	MMST918 RF transistor or any compatible
TR2	MMST918 RF transistor or any compatible

Appendix II

Component Values - Circuit Diagram (6)

B1	12V Battery
C1	1P9
C2	9 - 10pF
C3	Value depends on RF frequency
C4	470pF
C5	10pF
C6	3P3
C7	100pF
C8	Value depends on data frequency
C9	100nF
C10	1μF
C11	100nF
C12	1pF
D1	IN4148 diode or any compatible
D2	IN4148 diode or any compatible
D3	IN4148 diode or any compatible
IC1	MM53200 or UM3750
IC2	555 timer or any timer
L1	1.5μH
LD1	LED 3mm or any compatible
LD2	LED 3mm or any compatible
R1	20K
R2	10K
R3	100R
R4	100R
R5	Value depends on data frequency
R6	4K7
R7	750K
R8	10K
R9	4K7
RZ	418MHz Acoustic wave resonator or any frequency (depending on requirements of the Country)
SM1 - SM2	Button switches
TR1	MMST918 RF transistor or any compatible
TR2	Any NPN transistor with 10mA current

Appendix II

Component Values - Circuit Diagram (7)

Transmission TR-X-1

L1	1.5μH
C1	Value depends on RF frequency
C2	10pF
R1	10K
R2	20K
R3	100R
TRM	Trimmer set frequency
TR1	MMST918 RF transistor or any compatible

Transmission TR-X-2

L1	1.5μH
C1	9-10pF
C2	1P9
C3	1pF
C4	Value depends on RF frequency
C5	10pF
C6	100pF
C7	3P3
C8	470pF
R1	20K
R2	10K
R3	100R
R4	100R
TR1	MMST918 RF transistor or any compatible
RZ	418MHz Acoustic wave resonator or any frequency (depending on requirements of the Country)

Main Components

C1	10nF
C2	10nF
C3	10nF
C4	Value depends on data frequency
C5	100nF
C6	100nF
C7	1μF

Component Values - Circuit Diagram (7)

R1	4K7
R2	750K
R3	Value depends on data frequency
R4	10K
TR1	Any NPN transistor with 10mA current
D1	IN4148 diode or any compatible
D2	IN4148 diode or any compatible
D3	IN4148 diode or any compatible
IC1	MM53200 or UM3750 or any compatible
IC2	555 timer or any timer
LD1	LED 3mm or any compatible
LD2	LED 3mm or any compatible
B1	12V Battery
SM1 - SM2	Button switches

Component Values - Circuit Diagram (8)

Transmission TR-X-1

L1	1.5µH
C1	Value depends on RF frequency
C2	10pF
R1	10K
R2	20K
R3	100R
TRM	Trimmer set frequency
TR1	MMST918 RF transistor or any compatible

Transmission TR-X-2

L1	1.5µH
C1	9-10pF
C2	1P9
C3	1pF
C4	Value depends on RF frequency
C5	10pF
C6	100pF
C7	3P3
C8	470pF
R1	20K
R2	10K
R3	100R
R4	100R
TR1	MMST918 RF transistor or any compatible
RZ	418MHz Acoustic wave resonator or any frequency (depending on requirements of the Country)

Main Components

C1	10nF
C2	10nF
C3	100nF
C4	Value depends on data frequency
C5	1µF
C6	10nF
R1	4K7
R2	750K

Component Values - Circuit Diagram (8)

R3	Value depends on data frequency
R4	Value depends on data frequency
R5	10K
R6	10K
DTR1	Any Darlington NPN transistor with 10mA current
DTR2	Any Darlington NPN transistor with 10mA current
D1	IN4148 diode or any compatible
D2	IN4148 diode or any compatible
D3	IN4148 diode or any compatible
D4	IN4148 diode or any compatible
IC1	145026 encoder or compatible encoder
IC2	555 timer or any timer
LD1	LED 3mm or any compatible
LD2	LED 3mm or any compatible
B1	12V Battery
SM1 - SM2	Button switches

Component Values - Circuit Diagram (9)

Transmission TR-X-1

L1	1.5µH
C1	Value depends on RF frequency
C2	10pF
R1	10K
R2	20K
R3	100R
TRM	Trimmer set frequency
TR1	MMST918 RF transistor or any compatible

Transmission TR-X-2

L1	1.5µH
C1	9-10pF
C2	1P9
C3	1pF
C4	Value depends on RF frequency
C5	10pF
C6	100pF
C7	3P3
C8	470pF
R1	20K
R2	10K
R3	100R
R4	100R
TR1	MMST918 RF transistor or any compatible
RZ	418MHz Acoustic wave resonator or any frequency (depending on requirements of the Country)

Main Components

C1	10nF
C2	10nF
C3	100nF
C4	Value depends on data frequency
C5	1µF
C6	10nF
R1	4K7
R2	750K

Component Values - Circuit Diagram (9)

R3	Value depends on data frequency
R4	Value depends on data frequency
R5	10K
R6	47K
DTR1	Any Darlington NPN transistor with 10mA current
D1	IN4148 diode or any compatible
D2	IN4148 diode or any compatible
D3	IN4148 diode or any compatible
D4	IN4148 diode or any compatible
IC1	145026 encoder or compatible encoder
IC2	555 timer or any timer
IC3	HEX inverting schmitt trigger (any type)
LD1	LED 3mm or any compatible
LD2	LED 3mm or any compatible
B1	12V Battery
SM1 - SM2	Button switches

C mponent Values - Circuit Diagram (10)

Transmission TR-X-1

L1	1.5µH
C1	Value depends on RF frequency
C2	10pF
R1	10K
R2	20K
R3	100R
TRM	Trimmer set frequency
TR1	MMST918 RF transistor or any compatible

Transmission TR-X-2

L1	1.5µH
C1	9-10pF
C2	1P9
C3	1pF
C4	Value depends on RF frequency
C5	10pF
C6	100pF
C7	3P3
C8	470pF
R1	20K
R2	10K
R3	100R
R4	100R
TR1	MMST918 RF transistor or any compatible
RZ	418MHz Acoustic wave resonator or any frequency (depending on requirements of the Country)

Main Components

C1	10nF
C2	10nF
C3	100nF
C4	Value depends on data frequency
C5	1µF
C6	10nF
R1	4K7
R2	750K

Component Values - Circuit Diagram (10)

R3	Value depends on data frequency
R4	10K
R5	10K
R6	10K
DTR1	Any Darlington NPN transistor with 10mA current
DTR2	Any Darlington PNP transistor with 10mA current
D1	IN4148 diode or any compatible
D2	IN4148 diode or any compatible
D3	IN4148 diode or any compatible
D4	IN4148 diode or any compatible
IC1	UM3758 180A/AM or any compatible
IC2	555 timer or any timer
LD1	LED 3mm or any compatible
LD2	LED 3mm or any compatible
B1	12V Battery
SM1 - SM2	Button switches

Component Values - Circuit Diagram (11)

Transmission TR-X-1

L1	1.5μH
C1	Value depends on RF frequency
C2	10pF
R1	10K
R2	20K
R3	100R
TRM	Trimmer set frequency
TR1	MMST918 RF transistor or any compatible

Transmission TR-X-2

L1	1.5μH
C1	9-10pF
C2	1P9
C3	1pF
C4	Value depends on RF frequency
C5	10pF
C6	100pF
C7	3P3
C8	470pF
R1	20K
R2	10K
R3	100R
R4	100R
TR1	MMST918 RF transistor or any compatible
RZ	418MHz Acoustic wave resonator or any frequency (depending on requirements of the Country)

Main Components

C1	1nF
C2	1nF
C3	100nF
C4	Value depends on data frequency
C5	1μF
C6	10nF
R1	4K7
R2	750K

Appendix II

Component Values - Circuit Diagram (11)

R3	Value depends on data frequency
R4	10K
R5	47K
DTR1	Any Darlington NPN transistor with 10mA current
D1	IN4148 diode or any compatible
D2	IN4148 diode or any compatible
D3	IN4148 diode or any compatible
IC1	UM3758 180A/AM or any compatible
IC2	555 timer or any timer
IC3	HEX inverting schmitt trigger (any type)
LD1	LED 3mm or any compatible
LD2	LED 3mm or any compatible
B1	12V Battery
SM1 - SM2	Button switches

Component Values - Circuit Diagram (12)

Transmission TR-X-1

L1	1.5μH
C1	Value depends on RF frequency
C2	10pF
R1	10K
R2	20K
R3	100R
TRM	Trimmer set frequency
TR1	MMST918 RF transistor or any compatible

Transmission TR-X-2

L1	1.5μH
C1	9-10pF
C2	1P9
C3	1pF
C4	Value depends on RF frequency
C5	10pF
C6	100pF
C7	3P3
C8	470pF
R1	20K
R2	10K
R3	100R
R4	100R
TR1	MMST918 RF transistor or any compatible
RZ	418MHz Acoustic wave resonator or any frequency (depending on requirements of the Country)

Main Components

C1	10nF
C2	10nF
C3	100nF
C4	1μF
C5	100nF
R1	4K7
R2	750K
R3	10K

Component Values - Circuit Diagram (12)

R4	47K
DTR1	Any Darlington NPN transistor with 10mA current
D1	IN4148 diode or any compatible
D2	IN4148 diode or any compatible
D3	IN4148 diode or any compatible
D4	IN4148 diode or any compatible
D5	IN4148 diode or any compatible
IC1	See Circuit Diagram 13
IC2	555 timer or any timer
IC3	HEX inverting schmitt trigger (any type)
LD1	LED 3mm or any compatible
LD2	LED 3mm or any compatible
B1	12V Battery
SM1 - SM2	Button switches

Component Values - Circuit Diagram (13)

Transmission TR-X-1

L1	1.5µH
C1	Value depends on RF frequency
C2	10pF
R1	10K
R2	20K
R3	100R
TRM	Trimmer set frequency
TR1	MMST918 RF transistor or any compatible

Transmission TR-X-2

L1	1.5µH
C1	9-10pF
C2	1P9
C3	1pF
C4	Value depends on RF frequency
C5	10pF
C6	100pF
C7	3P3
C8	470pF
R1	20K
R2	10K
R3	100R
R4	100R
TR1	MMST918 RF transistor or any compatible
RZ	418MHz Acoustic wave resonator or any frequency (depending on requirements of the Country)

Main Components

C1	10nF
C2	10nF
C3	100nF
C4	100nF
C5	1µF
R1	4K7
R2	750K
R3	10K
R4	47K

Appendix II

Component Values - Circuit Diagram (13)

DTR1	Any Darlington NPN transistor with 10mA current
D1	IN4148 diode or any compatible
D2	IN4148 diode or any compatible
D3	IN4148 diode or any compatible
D4	IN4148 diode or any compatible
D5	IN4148 diode or any compatible
IC1	See Exploded Diagram IC1
IC2	555 timer or any timer
IC3	HEX inverting schmitt trigger (any type)
LD1	LED 3mm or any compatible
LD2	LED 3mm or any compatible
B1	12V Battery
SM1 - SM2	Button switches

Appendix II

Component Values - Circuit Diagram (14)

A1-2-3-4	CD 4077 or any compatible
B1-2-3	CD 4025 or any compatible
C1	100µF
C2	100µF
C3	100µF
C4	22µF
C5	10µF
C6	10µF
C7	330pF
C8	22µF
C9	10µF
C10	22µF
C11	330pF
C12	1µF
C13	22µF
D1	1A - 200v
D2	1A - 200v
D3	1A - 200v
D4	4148 diode or any compatible
D5	4148 diode or any compatible
D6	4148 diode or any compatible
D7	4148 diode or any compatible
D8	4148 diode or any compatible
D9	4148 diode or any compatible
D10	4148 diode or any compatible
D11	4148 diode or any compatible
D12	4148 diode or any compatible
D13	4148 diode or any compatible
D14	4148 diode or any compatible
D15	4148 diode or any compatible
D16	4148 diode or any compatible
D17	4148 diode or any compatible
D18	4148 diode or any compatible
D19	4148 diode or any compatible
G1-2-3-4-5-6	CD 40106 or any compatible
IC1	CD 4013 or any compatible
PZ1	Dip switches
PZ2	Dip switches

Appendix II

Component Values - Circuit Diagram (14)

R1	47K
R2	4K7
R3	120K
R4	1K5
R5	22K
R6	4K7
R7	10K
R8	4K7
R9	4K7
R10	10K
R11	47K
R12	15K
R13	1K5
R14	22K
R15	47K
R16	4K7
R17	10K
R18	47K
R19	4K7
R20	4K7
R21	4K7
R22	10K
R23	4K7
R24	20K
R25	100K
R26	15K
R27	22K
R28	100K
RL1	10A-12v regulator or any compatible
RL2	10A-12v regulator or any compatible
RL3	10A-12v regulator or any compatible
TR1	BD139 transistor or any compatible
TR2	BC337 transistor or any compatible
TR3	BC337 transistor or any compatible
TR4	BC337 transistor or any compatible
Z1	9V Zener

Component Values - Circuit Diagram (15)

C1	Value depends on data frequency
C2	Value depends on data frequency
IC1	MM5320 or UM3750 or compatible
IC2	MM53200 or UM3750 or compatible
R1	Value depends on data frequency
R2	Value depends on data frequency

Component Values - Circuit Diagram (16)

C1	Value depends on data frequency
C2	Value depends on data frequency
C3	Value depends on data frequency
C4	Value depends on data frequency
IC1	M145028 or any compatible
IC2	M145028 or any compatible
R1	4K7
R2	4K7
R3	4K7
R4	4K7
R5	10K
R6	10K
R7	Value depends on data frequency
R8	Value depends on data frequency
R9	Value depends on data frequency
R10	Value depends on data frequency
TR1	Any NPN transistor with 10mA current
TR2	Any PNP transistor with 10mA current

Appendix II

Component Values - Circuit Diagram (17)

C1	Value depends on data frequency
C2	Value depends on data frequency
IC1	UM3758 180A/AM or compatible
IC2	UM3758 180A/AM or compatible
R1	Value depends on data frequency
R2	Value depends on data frequency

Component Values - Circuit Diagram (18)

RECEIVER (1)

C1	1nF
C2	1nF
C3	390pF
C4	2pF
C5	Depends on RF frequency
C6	Depends on RF frequency
C7	Depends on RF frequency
C8	1nF
C9	100μF
C10	1μF
C11	Depends on RF frequency
C12	22μF
I C	LM358 or any compatible
L1	Depends on R of aerial
L2	82μH
L3	Depends on RF frequency
LF	Depends on RF frequency of receiver set up RF trimmer
R1	12K
R2	33K
R3	1K
R4	10K
R5	270R
R6	56K
R7	22K

RECEIVER (2)

*	C1	1nF
*	C2	1nF
*	C3	390P
*	C4	2P
*	C5	Depends on RF frequency
*	C6	Depends on RF frequency
*	C7	Depends on RF frequency
*	C8	1nF
*	C9	100μF
*	C10	1μF
*	C11	Depends on RF frequency
*	C12	22μF
*		
*	IC	LM358 or any compatible
*		
*	L1	Depends on R or aerial
*	L2	82μH
*	L3	Depends on RF frequency
*	LF	Depends on RF frequency of receiver set up RF trimmer
*	R1	12K
*	R2	33K
*	R3	1K
*	R4	10K
*	R5	270R
*	R6	56K
*	R7	22K

RECEIVER (1)

R8	6K8
R9	10K
R10	6K8
R11	2K
R12	100K
R13	30K
R14	6M8
R15	10K
R16	10K
R17	100K
R18	470K

RECEIVER (2)

*	R8	6K8
*	R9	10K
*	R10	6K8
*	R11	2K
*	R12	100K
*	R13	30K
*	R14	6M8
*	R15	10K
*	R16	10K
*	R17	100K
*	R18	470K

Appendix II

Component Values - Circuit Diagram (18)

RECEIVER (1)

R19	6M8
TR1	MMST918 RF transistor or any compatible
TR2	MMST918 RF transistor or any compatible
TR3	2570 transistor or any compatible

RECEIVER (2)

* R19	6M8
* TR1	MMST918 RF transistor or any compatible
* TR1	MMST918 RF transistor or any compatible
* TR3	2570 transistor or any compatible

Component Values - Circuit Diagram (19)

A1-2-3-4	4077 or any exclusive NOR
B	9v Battery
B1-2	4025 or any triple input NOR
C1	100µF
C2	47µF
C3	22µF
C4	22µF
C5	100µF
C6	22µF
C7	10.47µF
C8	10µF
C9	10µF
C10	330pF
C11	1µF
D1	1A - 100v
D2	1A - 100v
D3	1A - 100v
D4	1A - 100v
D5	1A - 100v
D6	1A - 100v
D7	1A - 100v
D8	1A - 100v
D9	1A - 100v
D10	IN4148 diode or any compatible
D11	IN4148 diode or any compatible
D12	IN4148 diode or any compatible
D13	IN4148 diode or any compatible
D14	IN4148 diode or any compatible
D15	IN4148 diode or any compatible
D16	IN4148 diode or any compatible
D17	IN4148 diode or any compatible
D18	IN4148 diode or any compatible
D19	IN4148 diode or any compatible
D20	IN4148 diode or any compatible
D21	IN4148 diode or any compatible
D22	IN4148 diode or any compatible
D23	1A - 100v
D24	1A - 100v
D25	1A - 100v
D26	1A - 100v

Appendix II

Component Values - Circuit Diagram (19)

DTR1	Any NPN Darlington transistor with 1mA current
IC1	4013 or any Flip-Flop
R1	10K
R2	2K
R3	150K
R4	10K
R5	4K7
R6	100K
R7	10K
R8	1K
R9	1K
R10	47K
R11	4K7
R12	1K5
R13	22K
R14	4K7
R15	10K
R16	10K
R17	220K
R18	47K
R19	47K
R20	47K
RL1	10A - 12v
RL2	10A - 12v
RL3	10A - 12v
RL4	10A - 12v
RL5	10A - 12v
TR1	Any PNP transistor or compatible
TR2	Any NPN transistor or compatible

Component Values - Circuit Diagram (20)

A1-2-3-4	4077 or any exclusive NOR
B	9v Battery
B1-2	4025 or any triple input NOR
C1	100µF
C2	47µF
C3	22µF
C4	22µF
C5	100µF
C6	100µF- 200µF
C7	10µF
C8	10µF
C9	22µF
D1	1A - 100v
D2	1A - 100v
D3	1A - 100v
D4	1A - 100v
D5	1A - 100v
D6	1A - 100v
D7	1A - 100v
D8	1A - 100v
D9	1A - 100v
D10	1A - 100v
D11	1A - 100v
D12	IN4148 diode or any compatible
D13	IN4148 diode or any compatible
D14	IN4148 diode or any compatible
D15	IN4148 diode or any compatible
D16	IN4148 diode or any compatible
D17	IN4148 diode or any compatible
D18	IN4148 diode or any compatible
D19	IN4148 diode or any compatible
D20	IN4148 diode or any compatible
D21	IN4148 diode or any compatible
D22	IN4148 diode or any compatible
D23	1A - 100v
D24	1A - 100v
D25	1A - 100v
D26	1A - 100v
DTR1	NPN Darlington transistor or compatible

Component Values - Circuit Diagram (20)

R1	4K7
R2	100K
R3	4K7
R4	10K
R5	150K
R6	10K
R7	2K
R8	1K
R9	1K
R10	47K
R11	220K
R12	47K
R13	10K
R14	10K
R15	4K7
R16	47K
R17	4K7
R18	1K
RL1	10A - 12v or any relay depending upon application
RL2	10A - 12v
RL3	10A - 12v
RL4	10A - 12v
RL5	10A - 12v
TR1	PNP transistor or compatible
TR2	NPN transistor or compatible

Component Values - Circuit Diagram (21)

1- 4	4077 or any exclusive NOR
B	9v Battery
B1	4025 or any triple input NOR
B2	4025 or any triple input NOR
C1	100µF
C2	100µF
C3	47µF
C4	47µF
C5	100nF
C6	100nF
C7	10µF
C8	10µF
C9	1µF
C10	22µF
C11	33pF
C12	10µF
C13	22µF
C14	10µF
C15	1µF
C16	10µF
C17	Value depends upon 'on/'off' timing
D1	1A - 100v
D2	1A - 100v
D3	1A - 100v
D4	1A - 100v
D5	1A - 100v
D6	IN4148 diode or any compatible
D7	IN4148 diode or any compatible
D8	IN4148 diode or any compatible
D9	IN4148 diode or any compatible
D10	IN4148 diode or any compatible
D11	IN4148 diode or any compatible
D12	IN4148 diode or any compatible
D13	IN4148 diode or any compatible
D14	IN4148 diode or any compatible
D15	IN4148 diode or any compatible
D16	IN4148 diode or any compatible
D17	IN4148 diode or any compatible
D18	1A - 100v
D19	1A - 100v
D20	IN4148 diode or any compatible

BOARD (Z)

C1	Depends on value of data frequency
C2	Depends on value of data frequency
C3	100nF
C4	100nF
C5	10µF
D1	IN4148 diode or any compatible
D2	IN4148 diode or any compatible
D3	IN4148 diode or any compatible
R1	Depends on value of data frequency
R2	Depends on value of data frequency
R3	10K
R4	4K7
R5	4K7
R6	4K7
R7	1K
R8	1K
IC1	M145028
TR1	NPN transistor or compatible

BOARD (Z-Z)

C1	100nF
C2	Depends on value of data frequency
D1	IN4148 diode or any compatible
R1	Depends on value of data frequency
R2	Depends on value of data frequency
IC1	145026

Appendix II

Component Values - Circuit Diagram (21)

.21	IN4148 diode or any compatible
D22	IN4148 diode or any compatible
D23	IN4148 diode or any compatible
D24	1A - 100v
D25	1A - 100v
D26	1A - 100v
D27	IN4148 diode or any compatible
D28	IN4148 diode or any compatible
D29	IN4148 diode or any compatible
D30	IN4148 diode or any compatible
D31	IN4148 diode or any compatible
D32	IN4148 diode or any compatible
D33	IN4148 diode or any compatible
D34	IN4148 diode or any compatible
D35	1A - 100v
D36	1A - 100v
D37	1A - 100v
D38	1A - 100v
D39	1A - 100v
D40	IN4148 diode or any compatible
D41	IN4148 diode or any compatible
D42	IN4148 diode or any compatible
D43	IN4148 diode or any compatible
D44	1A - 100v
D45	1A - 100v
D46	1A - 100v
DTR1	NPN Darlington transistor with 10mA current
IC1	4022 or any compatible
IC2	CD4013 or any compatible
R1	4K7
R2	100K
R3	4K7
R4	10K
R5	1K
R6	100K
R7	1K
R8	47K
R9	1K
R10	4K7
R11	4K7
R12	150K
R13	1K5

Component Values - Circuit Diagram (21)

R14	22K
R15	15K
R16	47K
R17	47K
R18	4K7
R19	4K7
R20	10K
R21	10K
R22	220K
R23	47K
R24	47K
R25	1K
R26	1K
R27	47K
R28	4K7
R29	47K
R30	4K7
R31	4K7
R32	2K
R33	10K
RL1	10A - 12v or any compatible, dependent upon application
RL2	10A - 12v or any compatible
RL3	10A - 12v or any compatible
RL4	10A - 12v or any compatible
RL5	10A - 12v or any compatible
RL6	10A - 12v or any compatible
TR1	PNP transistor or compatible
TR2	NPN transistor or compatible
TR3	BD139 or any compatible
TR4	PNP transistor with 10mA current
Z1	13v Zener diode
Z2	9v Zener diode

TITLE OF INVENTION: Multi-Purpose Remote Control Radio Key with infinite code combination and ultimate protection against decoding and accessing of codes by any method including high-tech. radio frequency (RF) scanners, 'grabbers' and radio frequency (RF) receivers.

CLAIMS

1) A Multi-Purpose High-Security Electronic Remote Control Radio Key having infinite code combination and a unique method of protecting against accidental or intentional accessing of the data and code combination by any method including high-tech. radio frequency (RF) scanners, 'grabbers' and radio frequency (RF) receivers.

2) The idea behind this invention is to protect **any** Remote Control data and code combination from accidental and intentional accessing. Firstly, it protects the remote control code combination by using data and the national radio frequency of the country concerned, (i.e. in the U.K. it is presently 418MHz), and secondly it protects the code combination and data from high-tech. scanners, 'grabbers' and RF receivers. This is carried out by using a minimum of two radio frequencies, i.e. the national radio frequency of the country concerned plus one or more extra radio frequencies.

3) The idea is to give total protection for the remote control data and code combination even when the most basic encoder/decoder I.C's are used.

4) The idea is to protect **any** remote control data and code combination against the most sophisticated, high-tech. memory scanning devices. This is carried out by cutting half of the combination or data and then transmitting this with an RF frequency of any value (in the U.K. this is presently 418MHz) The remaining combination or data along with the second radio frequency transmission is then transmitted on a totally different radio frequency. The second radio frequency can be of any value but must be different from the value of the first radio frequency transmission.

A minimum of two radio frequencies are used dependent upon the level of protection that is required and dependent upon the number of channels that are operated.

5) Any person with a scanner knows the national radio frequency of the country (i.e. U.K. 418MHz at present) but they would not know the subsequent radio frequency, or frequencies, of this product's transmission.

In the U.K., therefore, a scanner would be set at 418MHz but after a scanner accesses half of the data and code combination, immediately afterwards the second half of the data and code combination would be required to affect and decode the remote control system.

6) The Multi-Purpose High Security Electronic Remote Control Radio Key can be used for numerous applications. It can be used in the home, in the garage or commercially to operate any automatic device where high-security protection and remote operation is required, i.e. car alarms, home security, safe boxes, garage doors, window blinds, etc.

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Patents Act 1977
Examiner's report to the Comptroller under Section 17
(The Search report)

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Relevant Technical Fields

(i) UK Cl (Ed.N) G4H (HRBE, HRBS)

(ii) Int Cl (Ed.6) G08C, B60R

Search Examiner
M J DAVIS

Date of completion of Search
10 MAY 1995

Databases (see below)
(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii) ONLINE: WPI

Documents considered relevant following a search in respect of Claims :-
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Category	Identity of document and relevant passages		Relevant to claim(s)
X	GB 2119141 A	(MASTIFF SECURITY) whole document	see letter
X	GB 1478485	(SONY) whole document	see letter
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